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ACUTE NITROGLYCERINE POISONING

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THIS paper was prompted by my experience recently in a case in which a man was tried for a common assault which it was alleged he committed while under the influence of alcohol. In accordance with the medical evidence, I expressed the opinion that, though the behaviour of the accused was consistent with intoxication from alcohol, it was not only also consistent with, but overwhelmingly in favour of, intoxication from nitroglycerine. Owing to the requirements of war, many thousands of people are now exposed daily to nitroglycerine and nitroglycerine-containing materials. My purpose, therefore, is to outline briefly the toxicology of nitroglycerine; the resemblance between nitroglycerine poisoning and alcoholic intoxication; the peculiar effect of even small amounts of alcohol on a person who has absorbed nitroglycerine and, thus, the hazards and necessary precautions in the manufacture and handling in general of nitroglycerine and nitroglycerine-containing materials.

OCCURRENCE

Nitroglycerine or glyceryl trinitrate— $C_3H_5(ONO_2)_3$ —was discovered in 1846. It is a heavy (specific gravity, 1.6) colourless, odourless, oil and has a sweetish, burning taste. It is almost insoluble in water, sparingly soluble in alcohol, readily soluble in ether and explodes with great violence when it is suddenly heated or subjected to percussion. It has a variety of uses in peace and in war. In medicine, it is generally used in tablet form (tab. trinitrini) or in the form of a 1% solution containing alcohol (sp. glyceryl. nitrat.). Dynamite, cordite, and blast-

ing gelatine are examples of explosives of which nitroglycerine is the principal constituent.

Most cases of poisoning are accidental and occur in the manufacture of explosives. Most of the *fatal* cases have been caused by overdosage of the drug used as a cardiac sedative. Homicide by nitroglycerine has been described. In most of these cases, the nitroglycerine was added to alcoholic drinks.⁹ Its use to produce disorderly action of the heart for the purpose of malingering to escape military service is old.^{1, 2}

PHARMACOLOGY

Like other nitric esters, nitroglycerine is readily reduced in the body to nitrite³ and thus has a powerful action on the peripheral arteries, causing them to dilate—"nitrite effect". Its action is similar to amyl nitrite, but the effect is more prolonged.^{4, 9} The action on the blood vessels is a direct one. The fall of blood pressure which it produces, for example, is not due to inhibition of the vasomotor centre. In fact, the latter is stimulated by the resultant cerebral anaemia; but the stimulation is not sufficient to counteract the widespread peripheral depression.⁵

Poisoning may occur by ingestion, inhalation, and by absorption from the skin. Nitroglycerine is absorbed by intact skin.^{5 to 9, 15, 17} Persons engaged in its manufacture and those who handle nitroglycerine-containing materials with bare hands develop headache readily. It also has a local irritant action, as shown, at times, by skin eruptions and ulcerations of the finger tips and below the nails.^{5, 8} The vapour of nitroglycerine is a powerful poison even when much diluted with air.⁶

INDIVIDUAL SUSCEPTIBILITY AND HABITUATION

Like all other poisons, the susceptibility to poisoning from nitroglycerine varies with the individual. In one experiment¹ a military officer sucked a quarter of a small strand (ap-

proximately 8 x 1 mm.) of cordite (contains 58 parts of nitroglycerine) for two minutes only and, though the diminution of the size of the strand was "scarcely appreciable" (cordite is scarcely soluble in the mouth), it caused a "most racking, splitting headache" which lasted for 36 hours. As little as 0.001 c.c. has produced a "most severe headache".^{7, 9} The usual medicinal dose of 0.01 grains may not be tolerated, and at the above-mentioned trial the writer developed a severe headache merely from handling and kneading a nitroglycerine-containing explosive for a few minutes. Simply shaking hands with a worker whose hands are contaminated with nitroglycerine may cause headache.¹⁵

New workers are very susceptible to the poison^{10, 18} but, by constant exposure to nitroglycerine, most workers, after a few days, acquire an immunity towards it.^{6, 7, 15, 18} The writer knows of a man who has been engaged in the manufacture of nitroglycerine for over 30 years and is not affected by it. The immunity, in most cases, is, however, generally transient; headache may reappear when work is resumed after a week-end or holiday.^{6, 7, 15, 18} For this reason, some workers make it a practice to rub nitroglycerine into their hands or hat-bands in order to avoid "Monday headache". This is an old practice.^{15, 18} The transient immunity is probably due to the rapidity with which nitroglycerine is eliminated.⁶ The immunity is lessened by hot weather^{4, 18} or indulgence in alcohol (see below). About 2 to 3% of workers never acquire an immunity and must change their occupation.

FATAL DOSE AND FATAL PERIOD

Judging from a number of experiences, the minimum lethal dose is probably two minims of the pure product;^{4, 10, 12, 13} but, like all other poisons, there have been extreme cases. In one case, 20 grains produced "only slight effects"⁵ and a tolerance up to 6 grains a day has been described.^{4, 9} Even with very large doses, death may be delayed one or two hours. It generally occurs in 2 to 6 hours.

SIGNS AND SYMPTOMS

Practically all of the immediate signs and symptoms are due to reduction of blood pressure⁵ and may appear within a few minutes to one hour or more after exposure to the nitroglycerine.¹⁵ The most common symptom is headache—"powder headache", "nitroglycerine

head"—though it may be absent when other signs are present.⁶ The headache is generally preceded by a sensation of warmth and fullness in the head^{7, 15} and starts at the forehead and moves upward towards the occiput.¹⁰ It may extend down to the back of the neck⁶ and remain for hours or several days.^{7, 10} Accompanying the headache there is generally intense throbbing in the head^{6, 7, 15, 18} which is most distressing. In severe cases, the victim holds his head between his hands to relieve it. Walking or attempting to stoop over produces intense pain. The recumbent position may be unbearable. Sleep may, therefore, be out of the question.¹⁵ In very severe cases, complete blindness of one or both eyes may precede the headache,⁷ but the blindness is temporary; when the headache begins, the vision clears.^{7, 15}

In mild cases, headache may be the only sign of poisoning. In more severe cases, the intense throbbing in the head is accompanied by palpitation of the heart¹¹ visible carotid pulsations¹ and there may be pulsations all over the body even to the tips of the fingers;^{6, 14} the face is flushed,^{7, 9} nausea and vomiting may occur^{6, 15, 17} and also colicky pains^{5, 9} and diarrhoea.¹³ Sweating,^{9, 13} dry throat,⁸ polyuria^{4, 15} and bronchitis⁸ are other signs. Tremor of the hands is common.^{7, 16}

In very severe cases, the signs are not due entirely to lowering of blood pressure; the heart muscle is affected directly and the heart beats are weakened.³ There may be delirium and convulsions^{4, 9} or sudden collapse.¹⁴ The respiratory centre is excited as in lack of oxygen. The breathing is thus at first quickened and deepened. Eventually it becomes embarrassed, the respirations become slower and shallower, the cyanosis deepens, and death finally occurs from asphyxia due to paralysis of the respiratory centre.^{3, 4, 12}

The blood may become chocolate-coloured, due to methæmoglobin, but, as a rule, not to the same extent as in amyl nitrite poisoning.^{4, 12}

MENTAL DISTURBANCES

From the medico-legal point of view, the mental disturbances met with in nitroglycerine poisoning are the most important. Drowsiness,⁴ stupor,³ insomnia,⁸ languor,⁶ and fear,⁴ are relatively minor considerations. More important are the effects of the very severe headaches, mental confusion,^{13, 14} dizziness,^{9, 17} mental excitement,⁸ pugnaciousness,¹⁸ hallucinations,¹ and

maniacal manifestations.^{1, 7, 9, 16} Because of the intense, throbbing pain the victim may become literally mad. There is the case of a mild-mannered man who struck at any person or object within reach, and of another individual who became wildly delirious and rushed about shrieking and hitting his head against trees and walls.^{7, 15, 18} Experiences described amongst cordite eaters are exactly those expected amongst people under the influence of alcohol.¹

EFFECTS OF ALCOHOL

A person who has absorbed nitroglycerine but is not suffering from it may become affected by the poison by ingestion of alcohol. A single cocktail may be sufficient.^{10, 18} One glass of beer only may precipitate severe headache and palpitation and produce flushing of the skin similar to that of scarlet fever.^{6, 7, 15} As stated, alcohol lessens the immunity from nitroglycerine. More important, however, is the *ease* with which the victim may become intoxicated.^{7, 15} There is the case in which a number of men, having had their usual dose of cordite and beer, began to talk and shout all at once. One proposed a war dance and, though it was a very cold night and they were in their underclothing only, the men left their tent and proceeded to execute a series of antics.^{1, 2}

More serious, however, is the severe form which the intoxication may assume at times. Alcohol and nitroglycerine are "guaranteed to produce a more violent and serious form of intoxication than any other combination known to man".⁶ The combination produces "a quarrelsome and destructive mania towards the best of friends even in an otherwise peacefully disposed individual" and may produce intoxication in a man who can commonly consume large quantities of alcohol with little or no disturbance of behaviour.^{1, 2, 16} It is capable of brutalizing the mildest man and making a temporary maniac of him. In one case, a man who had worked all day with explosives developed a headache and took "quite a little whisky" for it. Within a few hours he developed an acute homicidal mania, shot and wounded one man and killed another.^{7, 18} It is doubtful whether delirium has been caused by nitroglycerine, except when alcohol was taken in an attempt to relieve the headache.¹¹

POST-MORTEM APPEARANCES

Beyond the reddish-brown colour of the blood due to methæmoglobin, which is not invariably

present, there is nothing characteristic in the post-mortem appearances in nitroglycerine poisoning. Since nitroglycerine acts upon the blood vessels of the brain and meninges as elsewhere, the latter are congested, and the ventricles may contain some yellow serous fluid. When nitroglycerine is ingested, there may be signs of irritation of the gastro-intestinal tract, presumably from liberated nitrous acid. The mucous membrane of the respiratory tract is, at times, coloured a reddish-brown.⁴

Nitroglycerine is readily broken down in the body⁴ and, for this reason, is difficult to isolate from the tissues for toxicological investigation. Therefore, analysis of the stomach and its contents is the most likely to yield the only positive results. In all cases, therefore, where such investigation is necessary, the pathologist should isolate the stomach without opening it and send it for chemical examination as soon as possible.

HAZARDS AND PREVENTION OF POISONING FROM NITROGLYCERINE

From the above outline of the toxicology of nitroglycerine, it might appear that poisoning amongst workers in the manufacture of nitroglycerine and in the handling of nitroglycerine-containing materials is very common. Actually, aside from mild headaches amongst new workers, poisoning is very uncommon in old industrial organizations. Most accidents occur in new organizations where the necessary precautions are not fully appreciated. In fact, in well-established industries, where instructions for the prevention of poison are given in detail and are rigidly enforced, severe poisoning is rare. Change of clothing at the end of the day's work, and laundries in the factories, for example, prevent poisoning of workmen's wives from nitroglycerine vapour, which is readily produced when contaminated clothing is placed in hot water. Washing the hands thoroughly before meals and warning against putting anything in the mouth during work (such as a pencil) prevent poisoning from ingestion of nitroglycerine. Thorough washing at the end of the day's work before returning to home is important; use of a towel that a workman has wiped his hands or face on may precipitate a headache.⁶ In old organizations it is the rule to discourage workers from taking alcohol and,

* Even auscultating the chest of a worker contaminated with nitroglycerine has been known to result in inhalation of sufficient nitroglycerine vapour to produce headache.⁶

under no circumstances, should such persons take any alcohol when, as the result of their occupation, they have developed headaches.

TREATMENT

The accepted treatment of nitroglycerine poisoning is not very satisfactory. For mild headaches amongst new workers the most effective measure is to advise the worker to continue his work, whereby he will develop an immunity in a few days. As stated, about 2 to 3% only fail to develop such immunity. For very severe headaches a cold cloth or ice to the head is helpful. Bromides have no effect and irritate the stomach. Coal-tar derivatives and all depressant remedies should be avoided. Strong coffee is helpful. In severe cases, caffeine sodium benzoate (7½ grains) may be useful, if given intravenously. Ergot and adrenalin are worth trying. Belladonna has been found to be of benefit.¹⁴

In case of poisoning from ingestion of nitroglycerine the stomach should be washed out thoroughly, and diuresis should be induced by intravenous injection of glucose solutions. Caffeine sodium benzoate should be administered intravenously at 2 or 3-hour intervals. Catharsis should also be induced to aid elimination of the poison.

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HUMAN BEHAVIOUR AND ITS RELATION TO INDUSTRY*

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[This was the opening address in a series of lectures on special aspects of industrial medicine. The subjects to be dealt with fall mainly under three headings, sociology, psychology and psychiatry, and we hope to publish the special addresses on these from time to time. Dr. Ross speaks as an industrial physician and deals with the more general features of the relations between medicine and industry.—EDITOR.]

THERE are so many points in common between industrial medicine, nursing, industrial relations and personnel work that what I may say about doctors and nurses applies with equal force to personnel workers, social service workers and others who are interested in the human element in industry. The interests shared between the industrial medical department and the industrial relations department are particularly striking. They are both concerned primarily with the human element of industry; the industrial medical department with the physical and mental health of the worker; the industrial relations department with the general well-being and the promotion of contentment among the workers and satisfactory relations between employer and worker. Both departments are concerned with the supervision of working conditions. Both departments are factors in building and maintaining plant morale. Both departments share the distinction of being purely advisory in their functions, advisory both to management and to workers. They have no authority to hire, fire, or order employees to do this or that.

It is this fact which gives us a unique and privileged position in industry. It enables us to share the confidence of both employer and worker, and in many cases, to act as a buffer or interpreter between these two groups. The need for complete co-operation between the medical and industrial relations departments in their daily work is of prime importance, for they are complementary to each other and their functions should mesh smoothly and easily.

As an example of such co-operation, I might cite the case of a young man who was employed in the stores department of his company. It was a light job and he was doing well at it, so well, in fact, that in making a survey of personnel for promotion, the

* An address to doctors and nurses in industry and personnel administrators. Given under the auspices of the McGill Medical Faculty, January 12, 1944.

Industrial Relations Department considered him as an "up and coming" young man and was about to recommend him for work entailing greater responsibility. Fortunately, before making this recommendation, the doctor was consulted, and he pointed out that the man in question was suffering from the effects of an old rheumatic endocarditis and for that very reason had been assigned to this particular job. The proposed promotion entailed not only greater responsibility but greater physical activity, and there is no doubt that had his work been so changed, he would have suffered a serious breakdown.

Another instance is that of the man who applied to the Industrial Relations Department of his company for a loan. On enquiry, it was found that his wife had left him and that he wanted this loan to care for his three small children. On referring him to the doctor it was discovered that this employee was a man of very low mental calibre and was quite irresponsible—that was one reason his wife left him. Furthermore, he had already borrowed from many of his friends and relatives, one of whom was on the point of suing him to recover a loan. Now here was a case where a loan was not the answer to the problem. With the help of the Medical Department, the children were placed in an institution and the father, relieved of his family responsibility, was enabled to carry on.

The history of Industrial Medicine may be traced back as far as Greek and Roman times. Aristotle recorded information regarding diseases of runners and also prescribed a diet for gladiators. Plato noticed certain postural deformities among artisans. Pliny referred to the dangers caused by the handling of sulphur and zinc, and in his *Natural History*, makes mention of masks made of transparent bladders which were used by workers to protect themselves from metallic dust during the preparation of vermilion.¹ There are other references to similar observations and procedures in ancient times, but the history of industrial medicine, as we know it, is comparatively short. Beginning about the turn of the present century, the greatest advance has been made during the past twenty-five years. It is only within the past ten years that industrial nursing has reached its greatest development. Very recently, the American Medical Association has officially recognized industrial practice as one of the specialties in the preparation of its current medical directory. The American Association of Industrial Physicians and Surgeons has appointed a committee on qualifications for industrial medicine and surgery to work in conjunction with a similar committee representing the Section on Preventive and Industrial Medicine and Public Health of the American Medical Association.

The course of industrial medicine in Canada has been similar, although, to date we have not reached the same stage of organization within the profession that has been arrived at in the United States.

INDUSTRIAL MEDICINE AS A SPECIALTY

At this point, we may well ask how industrial medicine differs from any other type of medical practice, and what special knowledge an industrial physician and surgeon requires to qualify as a specialist in this field?

I think that the greatest single difference between the physician in private practice and the industrial physician is that in the case of the industrial physician, the company is his patient and not the individual. By "the company" I do not mean the shareholders, or the Board of Directors, or the Executive, or the office workers or day labourers. The company, in this case, is the whole industrial and social organization of which the individual worker is a part. When I say that the company is his patient, it does not mean for a moment that the doctor must neglect the individual, or consider the company at the expense of the individual. It does not mean that he should be recognized as "the company doctor" with the implication of bias in favour of management which such a title may suggest. But it does mean that just as the surgeon must treat a broken leg or the physician cure a digestive upset in order to cure the individual, so the industrial physician must treat the individual in his relation to the company and the health and well-being of the company as a whole. He must always consider the well-being of the individual in its relation to the whole organization. In extreme cases it may be necessary to "amputate" or "extract" a diseased or maladjusted individual for the good of the other employees of the company, but just as a radical operation is deferred as long as it is safe to do so, so every effort should be made to rehabilitate the individual before recommending his discharge. In accomplishing this objective, that is, treating the company as a patient, it is essential that the industrial physician must maintain a completely unbiased attitude, he must be absolutely fair and honest with the worker, with the company and himself.

As the doctor practising preventive medicine tries to keep his patient healthy and vigorous, in the same sense the objective of the industrial physician is to maintain, as far as possible, a healthy, vigorous whole organization from the president to the sweeper. Some companies go so far as to maintain a so-called physiotherapy or health department, a reconditioning department, upon which the industrial physician must keep an eye. I know of one company in which

the president is rather hipped on this idea. He is an elderly man and has made physiotherapy almost a fetish. He has installed such a department in his company and because the president thinks the treatment is good, he forces all his executives to take treatment. Incidentally, I may say that the executives do not grumble too much because this department is frequently used in order to get rid of a bad "hangover"! However, there is something in the basic idea and it is hoped that further research will develop the ethical side of this phase of preventive medicine to assist in maintaining the health of key executives and, of course, the rank and file of the working force.

In this connection it might be well to make this statement: Clearer knowledge and further development in the industrial field can come only as the result of the trained observation and accurate analysis of the industrial physician being directed upon the actual working conditions on the plant floor. An industrial physician recently stated that the doctor in industry should spend more time going through the plant than he does answering the telephone or handing out prescriptions.

The special qualifications required of an industrial physician, have been stated by McCord² as follows:

1. The industrial physician should have some experience in general practice in order that he may know man and his foibles.
2. He should have a knowledge of medical practice, not necessarily profound, of the fundamentals of industrial relations, of applied preventive medicine, of occupational diseases, of psychopathic medical investigations, of recreation, and of accidental prevention methods.
3. He should have a knowledge of the special problems relating to the employment of women and children; some knowledge of pensions and insurance, including liability and group; some knowledge of plant organization, which is likely to prove effective in dealing with the problems of labour.
4. He should have a knowledge of employment methods; some notion of job analysis, physical and mental tests to determine the fitness of applicants; a knowledge of race problems, industrial training, apprenticeship, continuation schools for training in particular jobs, and at least some knowledge in relation to the cost of living according to the local standards.
5. He should have knowledge of the hours of work in relation to fatigue and output; knowledge of shift systems, rest periods, regularity, absenteeism, labour turnover and its cost.
6. He should have at least a superficial knowledge of security and continuity of employment in slack seasons, while convalescing from accident or disease, in case of labour-saving improvements, as well as with the advent of old age.
7. He should have a general knowledge of physical working conditions, safeguards, disagreeable gases and dusts, heating, lighting, ventilation, locker rooms, wash rooms, rest rooms, restaurants, hospitals, laun-

dries, toilets, showers, plant beautification, drinking water, etc.

8. He should be qualified to carry out physical examinations of applicants, and periodic re-examinations of employees.

9. He should have very definite knowledge of housing, transportation, recreational and educational facilities; and the transfer and replacement of misfits—how to "fit the round peg into the round hole".

10. He should be familiar with follow-up work, especially among new employees and with the injured; and familiar with the replacement of injured and crippled employees.

From the foregoing, it will be seen that the individual physician must possess a knowledge of a great many subjects which do not come within the range of or particularly interest the doctor in private practice. Many of these subjects are not even touched upon in the ordinary medical course.

NURSING IN INDUSTRY

We may also ask how industrial nursing differs from other nursing, in particular, nursing in our hospitals? In the course of a nurse's training in a hospital and in her subsequent work, certain routines are followed. These have been established over a period of years to suit the needs of the hospital and the patient in the hospital. They are helpful to the nurse as well as the patient, and are necessary for the efficient operation of a hospital institution.

Industry also has its routines, which are directed toward production, plant and machinery maintenance, selling, etc., and their object is to get things done at a certain cost. Nurses entering industry experience a very definite conflict between the routines of the hospital and those of industry. Quite frequently, industrial routines seem to tear down those which nurses have been trained to follow. The industrial nurse, therefore, is called upon to blend hospital and industrial procedures. This is not as easy as it may appear on the surface. Nurses frequently resent the interference of industrial routine with that to which they have been trained. This resentment quite often brings about such an emotional disturbance as makes it impossible for the nurse to adjust herself to industry. Some of the qualifications, therefore, of an industrial nurse are that she must be open-minded, flexible and emotionally stable.

The relation between nurse and patient in industry is also quite different from that of the hospital. Patients are admitted to the hospital complete strangers to the nurses. In many cases, nurses get to know the patients personally

during their stay in hospital and may even learn something of their background and home conditions, but it is seldom that after a patient is discharged from the hospital the nurse ever sees or hears of him again. In the case of industrial nursing, the nurse is acquainted with the patient before he is ill or injured, and after his illness this acquaintance is followed up and maintained.

The industrial nurse, in addition to knowing the patient, is required to know something of his family life and social background. While the nurse is always concerned with the attitude and emotional state of the patient, she is called upon in industry to go further than that. It is the desire of industrial management that the employees of a plant shall have confidence in the nurses, that each individual employee shall feel that the nurse is his friend in the little, but all important, things so closely related to home life, family troubles, worries and fears. Industrial management has found that when employees feel that they can tell their troubles to the nurses, there are fewer grievances based on bitterness, worry and brooding. This implies that industrial nurses are called upon to employ, in addition to their technical skill, some of the simple fundamentals of psychiatry and psychology. Not only that, but the industrial nurse is even asked to give something of her maternal, sympathetic, friendly self to the solution of employees' personal problems.

It is quite natural, in view of the training of nurses, for the nurse to feel a professional and even a maternal interest in her patient and to utilize all factors and influences for the good of the patient only. As in the case of the doctor, industry requires another adjustment in this situation. The industrial nurse must be led to recognize the limitations of industry, the limitations of time and production demands. The care of her patient must be limited by these factors. As in the case of the industrial physician, the nurse must learn that the patient should be treated and cared for within certain time limits, within certain production demands. Production time schedules frequently interfere with clinic schedules. In hospital practice the nurse always has her patient available and treatment can be given when desired. In industry the clinic treatment must often be fitted in to suit the schedules of plant operations. In some cases the nurse may be forced to divide her day between time in the clinic and visits to

employees in their homes. She must be gradually led to understand that her total object is not the patient but rather the maintenance and preservation of a healthy, efficient working force. In short, the nurse is required to care for the patient in relation to production efficiency and plant morale.

This adjustment is particularly significant since it involves quite frequently the question of the ethics of medicine. Industrial routines, are, in many instances, unfair to the patient. In such cases, the nurse must determine whether or not she must fight for the welfare of the patient. Her opinion, her professional knowledge, must frequently be her authority for demanding certain concessions on behalf of the patient by industrial management. This is particularly true in cases of rehabilitation after serious illness or serious accident. In the case of employees who are being rehabilitated after illness or accident, for instance, in the case of a man who has had an operation for hernia, industrial routine may not provide for giving him the type of work or the hours of work which he requires. In such a case, it is the duty of the nurse, under the direction of the doctor to see that such an employee does not return to work too soon or until the routine of the plant can be modified to suit his requirements.

IMPORTANCE OF PERSONNEL SELECTION

What I have just said about doctors and nurses in industry applies in many respects with equal force to those engaged in industrial relations and personnel work. All jobs may be classified in two main groups, those which deal with things, and those that deal with people. Engineers have brought to industry a realization and an appreciation of machine design and construction. Great care is exercised on the part of the management before large sums of money are spent for certain types of machines. Because of this realization, management, particularly technical management, spends much time in determining whether or not it will buy a certain machine. Management does not apply this kind of thinking to the employment of human beings. There are some companies, and I regret to say a large number of such companies, who regard the hiring and performance of labour as a cheap commodity. They labour under the idea that human beings can be readily replaced, but expensive machinery cannot be so easily replaced. The management therefore,

concentrates its analysis and consideration on the machine and pays little attention to the proper assignment of the human being to the job. It is the task of the industrial physician, the psychologist, the psychiatrist, to so educate management that it will realize the significance of such factors as monotony, fatigue, temperature, ventilation, lighting, machine painting and working equipment as related to the adjustment, the co-operation and the job performance of the individual.

An excellent example of this type was the case of a woman, Bertha, who was employed in a large factory making tin cans. Her job was on one of the processing machines. She was a powerfully-built girl and was an excellent worker but had gained the reputation for being surly and irritable. This condition became so serious that the doctor was consulted. He found that there was no question of illness in this case, and made a point of watching Bertha at her machine during his tour of the plant. He asked her what was the matter with her job. Her reply was that the machine was "too damn slow", and she would like somebody to do something to speed it up. It was explained to her that speeding up the machine would mean that she would have to work harder. Upon her insistence, the machine was speeded up 26%. A few days later the doctor passed that way again and was delighted to see Bertha as busy as a beaver and wreathed in smiles.

While it is the task of plant managers, foremen and the industrial relations department to create working conditions and equipment which will call for a minimum of expenditure of energy and a maximum of comfort and cheerfulness to the worker, it devolves upon the industrial physician to give his final approval to the effectiveness of such surroundings and equipment.

Industry quite frequently fails to appreciate the significance of job misfits. Many an individual has entered a plant, a factory, or a store with strong hopes of working his way up to a substantial earning capacity, only to find that because of influences which he could not understand, he was a failure. Unwise selection and job assignment on the part of management or supervisors has, in many cases, brought that disastrous feeling of frustration and failure and made what might have been a productive member of a community nothing more than a social liability and an object of charity. Industrial management often fails to realize the bitter sense of defeat, the feeling of hopeless inferiority that comes to those that find themselves incapable of doing the job to which they are assigned.

Two striking examples of job misfits have recently come to my attention.

The first is that of a worker in Pittsburgh whose i.q. was close to that of a moron. He was hired as a barrow man at 56c. an hour, and his job was to load a wheel-barrow at one end of the yard, push it to the other end of the yard, empty it, and return, and to do this all day long. He liked his job, and he worked so well that his pay was increased to 60c. an hour. On the strength of this increase he got married. Following his marriage, the management decided that they would promote him, and they gave him a higher paid job, working in the plant on a machine which required quick reactions and considerable manual dexterity. The man was such an absolute failure at this job that after a period of trial he was slated for dismissal. He was referred to the Industrial Relations Department of his company.

In a completely bewildered state of mind, he said something to this effect: "I was happy pushing a wheelbarrow. I could live on 60c. an hour. I got married and now my wife is going to have a baby. Then they gave me another job. Now they say I am no good and they want to fire me." He broke down and wept and said: "Why can't a man be let do the same thing all the day long?" He was put back on the wheel-barrow job and has since proved a satisfactory employee.

In contrast to this case we had the following example in our own company within the past few weeks.

One of our plant managers told the head of our Industrial Relations Department that a certain man recently employed was an excellent worker, but that he had been using abusive language to one of our women employees and would have to be discharged. The man was sent to our Industrial Relations Department. He was a fine type of young French Canadian, 24 years of age. He had enlisted in 1939 and trained in England in commando work which finally brought him to the beach at Dieppe where he was wounded and had to be invalided home.

He was employed by us as one of a large group of new employees that were taken on in response to an urgent call for increased overseas export. The fact that he came in in this large group of individuals is our only excuse for assigning him to the job he had. This job consisted of taking empty cases from a table and placing them on a conveyor. These cases had been previously emptied by women. One of these women apparently had the habit of leaving a block of wood, which was used in her work, on the floor where this man tripped over it. Finally he blew up and practically went berserk.

This, I think, is an excellent example of a job misfit. Here was a man who had been trained for years as a fighter, he was tough, his whole training had been directed to making him hard, and to encourage him to fight furiously, and he was placed on a job which was monotonous and far below his physical abilities. The answer, in his case, was to give him a hard job, in fact, he asked for a harder job, and I believe has been happy and successful in his new assignment.

Industry must recognize its social obligation to the worker, to the home, to the community. It must recognize that when workers are assigned to jobs for which they are unsatisfactory and in which they fail, it is the responsibility of management and not the worker. Well-developed industrial relations departments have at their

heads well-trained industrial directors. These individuals have been taught, through new types of training, the importance of fitting the square peg into the square hole. However, this training has been only recently developed. Despite the training, industrial directors or employment managers have done a considerable degree of guessing or they have employed those hazardous empirical methods which are handed down from the past. It is the industrial physician who must check and verify the conclusions reached by the industrial relations department in order that job misfits may be reduced to a minimum.

The primary problems of employees are emotional problems. It can be safely said that 60% of plant employees will co-operate, are friendly and efficient. It is the 40% who constitute the so-called problem employees with which supervisors and management find their greatest difficulties. It must be recognized that the word "maladjustment" suggests, in a general sense, not so much a matter of intelligence and skill as it does emotional values, emotions of fear, insecurity, and antagonism. It can be safely said that the main problems in industry where human factors are concerned, are emotional problems. The industrial physician, the industrial nurse, and the personnel administrator is, therefore, dealing with emotional problems rather than logical problems.

To deal with these problems competently, one must have a knowledge of the cause and effect of emotional disturbances. In other words, one should know something of sociology, psychology and psychiatry. To be of practical value, this knowledge must be entrusted to us who are in daily contact with our workers and their problems. It is we, who have the confidence of workers and management, who are in the best position to apply this special knowledge. It is neither practical nor desirable to have psychiatrists regularly attached to the staff of industrial medical departments. In the first place, there are not enough psychiatrists to go round and even if there were, it would be impracticable to assign specialists of this type to industrial concerns. I think it is fairly generally agreed that in industry we must depend upon and apply our own knowledge of psychology and psychiatry, but this, of course, is only done within certain limits.

Dr. Giberson³ says "Industrial psychiatry can never hope to be anything but preventive, and selective—the separating of the sheep from

the goats. Actual therapy must remain where it has always been, in the hands of the private practitioner and the institutions, public or private, created for the purpose."

In the same article Dr. Giberson states that "The industrial physician can start an effective program at once, and that without the immediate need of specialized training other than a sympathetic understanding of the new objectives." She enumerates the following procedures which can be done without any very extensive knowledge of psychiatry.

1. He can expect and trace the emotional complications which will come with every injury and illness he treats or advises on. Even a rough record of his findings may provide valuable data for generalizations.
2. He can listen. The therapeutic value of the interview is considerable, and the connection between surface symptoms of seeming irrelevance such as insomnia, "stomach trouble", and vague neuralgias, with serious underlying conditions may be detected in time for remedial action.
3. He can diagnose the industrial trouble spots—foreman, environment, fatigue, group maladjustment—by analyzing and reviewing his cases at regular intervals.
4. He can spot the accident-prone, the accident repeaters.
5. He can recognize the obvious maladjusted types, arrive at a rough classification and dispose of them by advising transfer, outside therapeutic treatment, or education of the employee in simple principles of mental and physical hygiene.
6. He can help prevent maladjustment by exercising actively his advisory function: (a) by repeatedly bringing to the attention of management each proved instance of preventable maladjustments; (b) by encouraging foremen, section heads, and supervisors to come to him for advice and information on employee problems; (c) by doing all he can to bring the extra-industrial factors to bear upon any interpretation of employee difficulties.
7. He can conserve manpower and uphold morale through fighting to secure medical immunity for the emotionally ill.

The impression given by another speaker this evening* of throngs of men and women who were clamouring at the gates of our plants and factories for the right to earn a livelihood was most impressive. To us in the medical and industrial relations field, these thousands of individuals pose a special problem, and while the mind of management is rightly concerned with finding employment for these people, we must see that they are placed in the jobs which they can best perform. We must consider them, not merely as a throng of people, but individual human beings, each possessing his quota of vital, productive, creative, human energy. It is safe to say that no problem confronting industry is more serious than that of aiding the worker to use, to the fullest possible extent his own energy,

* Mr. J. C. Cushing, Vice-president of the National Breweries Limited.

his own ability, for his own comfort and success.

We cannot help the worker to make better use of his capacity and abilities unless we clearly understand the problems confronting men and women as they enter our complex social-industrial world. It is well, I think, to ask, "What does the worker bring to the job?" He brings his heredity, his health, his behaviour habits, his social attitude, and his emotional reactions. "How is the worker different from each other worker?" To begin with, the worker is the product of his particular type or kind of heredity. This means that physically, his organic function, his physiological make-up is at a particular level, a particular state of health. His heredity also pre-determines his intelligence, his capacity, and his skill. He comes from a particular type of home which has conditioned him in certain fundamental behaviour habits. His degree of emotional stability, his social attitude, have been pre-determined by parental influence, and by the influences of neighbourhood, school, and church. The quality or degree of self-reliance, initiative, response to authority, and his sense of personal responsibility, ethics and morals have been given direction by his early environment.

These are the things the worker brings to the job. In the degree in which he possesses these factors, he differs from every other individual. These are the factors that must be clearly understood, properly analyzed, and accurately evaluated. To properly measure and evaluate these factors or variations in their degree, new techniques are required, not the techniques based upon logic, mathematics, or chemical formulæ, not the techniques used in machine design, machine maintenance, planning and scheduling, and production. We need human techniques that can measure, evaluate and treat human factors such as attitudes, emotional responses, in short, the factors of human behaviour.

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The fundamentals of tuberculosis control are changed by neither war nor peace. They always are: Find the sick—treat the patient—restore his earning power—prevent the spread of the disease—keep the family together.—Kendal Emerson, M.D.

DIETARY STUDY OF TORONTO SCHOOL TEACHERS*

By J. H. Ebbs, M.D., F. F. Tisdall, M.D. and
Marjorie L. Scott, M.Sc.

Toronto

IN the early part of 1941 a committee was formed, composed of representatives of the Toronto Board of Education, the Toronto Teachers' Council, and the Department of Pædiatrics, University of Toronto, to plan a dietary study of a group of teachers. The objects of this study were as follows: (1) To determine whether or not the diets of the teachers could be improved. (2) To observe the influence in one group of teachers of any improvement of dietary habits upon the health, the number of illnesses suffered, and the number of days of absence from school due to illness. (3) To observe the influence of vitamin-mineral pills upon the health and days of absence in another group of teachers. (4) To compare the two groups with respect to the number of new cavities in the teeth. (5) To compare the health and dental records with a third group which received neither diet advice nor pills. (6) To create among the teachers an interest in nutrition and through them increase the knowledge of nutrition of a large group of school children, who would in turn probably exercise an influence on the home dietary picture.

One thousand teachers volunteered to take part in the study, dividing themselves into two groups: Group I, those wishing to improve their diets if possible, and Group II, those desiring to take vitamin-mineral pills. At group meetings, instructions were given for the recording of a detailed food diary for one week. At the same time information was recorded by each teacher regarding the source of meals, *i.e.*, home, boarding-house or restaurant, whether on a special diet, whether receiving medical treatment, whether taking any vitamin preparations, whether the general health could be considered "good", "fair" or "poor". Illness suffered during the year previous to the commencement of the study, with duration and number of days absent from school was also recorded. Height and weight were obtained by the individual teacher. The number of teeth removed, the

* From the Department of Pædiatrics, University of Toronto and the Hospital for Sick Children, Toronto, under the direction of Alan Brown, M.D., F.R.C.P.(Lond.).

total number with dental fillings, and the number of fillings in the year previous to the commencement of the study were recorded. Each teacher was asked to keep a record of the number of colds and other illnesses, with duration, including those which did not cause absence, also the number of days absent from teaching for each illness, and a dental record during the year of study (May, 1941 to May, 1942).

The dietary record for one week and the above information were sent to the Department of Paediatrics, under a code number, known only to a representative in each school. The school as well as the individual teacher was given a code. The food-records were quickly analyzed, and a food score or rating was sent to each teacher showing their average food intake in comparison with the recommended food intake for each of five main groups, namely, dairy products, vegetables, fruits, cereals and meat (Fig. 1).

The score sheet sent to Group I, showing the score obtained in comparison with the score if satisfactory, was supplemented with specific

statements pointing out what should be done to improve the score. No instructions were given to Group II, who were supplied with a vitamin-mineral preparation* containing the following daily amounts:

Vitamin A—10,000 international units.
Vitamin D—1,750 international units.
Vitamin E—As contained in 2½ oz. whole wheat.
Vitamin B₁—222 international units (0.67 mgm.).
Vitamin B₆—25 gamma.
Nicotinic acid—10 mgm.
Riboflavin—100 gamma.
Vitamin C (ascorbic acid)—300 international units (15 mgm.).
Ferrous sulphate exsiccated—1½ grains (100 mgm.).
Dibasic calcium phosphate—1½ grains (100 mgm.).
Also traces of copper, manganese and iodine.

In October, 1941, a second food record was obtained for one week from Groups I and II. This was analyzed and another food score sheet was sent to each teacher with instructions to those in Group I who could further improve their diets.

At the end of the year of study (May, 1942), a third food record was obtained from Group I

* The vitamin-mineral preparation used was Alphamin, manufactured by Ayerst, McKenna & Harrison Limited, of Montreal, Que., and Rouses Point, N.Y.

FIGURE 1.
SCORING OF YOUR FOOD INTAKE IN COMPARISON WITH A SATISFACTORY FOOD INTAKE

Food group	Score if satisfactory	Score obtained	Food group	Score if satisfactory	Score obtained
1. Dairy products.			3. Fruits.		
(a) Milk—15 oz. including that used in the cooking. Cream scores as milk. One helping of cheese scores as 4 oz. of milk. One ounce of milk makes 6 points in the score. Under certain circumstances a good excess of milk may make up for a deficiency of the B group of vegetables.		100%	(a) Tomato juice—7 oz. or Grapefruit juice—4 oz. or Orange juice—3 oz. and		100%
(b) Butter—2 oz. including that used in cooking. 1 oz. scores as 5 points.			(b) Other fruits—One serving of other fruits scores 10%.		
2. Vegetables.			Under certain circumstances an excess of the "a" group of fruits may make up for a deficiency of the "c" group of vegetables.		
One serving averages 3 to 4 ounces.			4. Cereals.		
(a) 1 serving of potatoes and			(a) 4 slices of whole grain bread and		100%
(b) 1 serving of a yellow or green leafy vegetable such as carrots, squash, broccoli, spinach, Swiss chard, Brussel sprouts, asparagus, string beans, or a legume as green peas or beans.		100%	(b) 1 serving of whole grain cereal such as rolled wheat or rolled oats, or two additional slices of whole grain bread.		
(c) Cabbage, turnips or tomato (One salad scores as one vegetable.)			5. Meats.		
			(1 serving averages 3 to 4 ounces.)		
			(a) 1 serving of meat, or fish, or poultry and		100%
			(b) 1 serving of egg, or liver, or kidney, or tongue, or sweetbreads.		

The above foods will supply the essential food elements in the amounts required for good health, with the exception of sufficient calories. Although there are wide individual variations the average adult doing office work requires in the case of men 2,800 calories per day, and in the case of women 2,400. 1,900 calories per day are furnished by the above foods; additional calories may be obtained by increased amounts of these foods, or other foods not here listed.

and Group II, and at the same time a third group of teachers was asked to volunteer to supply information regarding diet, illness, absence and dental troubles. This was used as a control group. These teachers had received neither dietary advice nor vitamin pills.

It was hoped that approximately 500 teachers would enter each of the three groups, but at the end of the year it was found that the numbers had been reduced by resignations, changes in school, joining of the Armed Forces, and incomplete information (Table I).

Table II is based upon the analyses of the diets in terms of the main food groups as shown on the score sheet. If a diet showed one or more food groups below 50%, it was rated as "poor"; if one or more food groups scored below 75% but not below 50%, it was rated as "fair". If all food groups were above 75%, it was rated as "good". Whereas 38% of Group I had what were termed "poor" diets in their first record (May, 1941), only 5% had such a rating in May, 1942.

In Group I, 62% of the teachers improved their diets during the year, while 54% of Group II teachers improved their diets (Table III).

In Table IV the average daily consumption of each food nutrient is recorded for the three food records in each group. It will be noted that the average of 85 analyses of the first records of Group I showed 69.9 gm. of protein consumed per day. This was increased through dietary advice so that the average in May, 1942,

TABLE I.
GENERAL INFORMATION

	Group 1 (Diet)	Group 2 (Pills)	Group 3 (Controls)
Number of teachers— volunteered.....	502	483	310
Number of teachers— completed study.....	360	387	293
Average age.....	41.3	40.0	39.2
Percentage of male teachers.	29.5	26.9	22.0

TABLE II.
PRELIMINARY RATING OF FOOD RECORDS

	Group 1 (Diet)			Group 2 (Pills)			Group 3 (Controls)
	1st record	2nd record	3rd record	1st record	2nd record	3rd record	One record
Poor.....	38	18	5	55	34	18	30
Fair.....	38	28	22	27	31	29	35
Good.....	24	53	72	17	34	52	35

TABLE III.
CHANGE IN DIET SCORE

	Group 1 (Diet)	Group 2 (Pills)
Improved diets.....	62%	54%
Unchanged.....	36%	42%
Diets, worse.....	2%	4%

TABLE IV.
AVERAGE DAILY CONSUMPTION OF NUTRIENTS

	Group 1 (Diet)			Group 2 (Pills)		
	1st record	2nd record	3rd record	1st record	2nd record	3rd record
Protein.....	(85) 69.92	(81) 74.22	(80) 74.97	(99) 67.8	(97) 74.2	(84) 70.9
Calories.....	2,275	2,410	2,381	2,221	2,376	2,352
Calcium.....	0.813	0.924	0.954	0.810	0.888	0.867
Iron.....	13.25	14.48	14.82	12.74	14.15	13.95
Vitamin A...	6,626	8,477	8,960	5,992	7,550	8,822
Vitamin B ₁ ...	405	480	498	393	459	451
Vitamin C (raw)...	74.5	74.4	84.3	78.3	74.8	83.5
Vitamin B ₂ ...	1.69	2.02	2.06	1.58	1.86	1.77

was up to 74.9 gm. The average amount of calcium was increased from 0.81 to 0.95 gm. The average amount of iron was increased from 13.2 to 14.8 mgm. The amount of vitamin A was increased from 6,600 international units to 8,900 international units; vitamin B₁ from 405 to 498 international units; vitamin C was increased from 74.5 to 84.3 mgm., and vitamin B₂ from 1.69 to 2.06 mgm. per day. In Group II there was a slight improvement, but not so marked as in Group I. The average protein, calcium, vitamin A, vitamin B₁ and vitamin C showed some improvement.

Table IV does not, however, show the number who were below the minimum requirements. This is illustrated in Table V. It will be seen that the number taking less than the recommended amount of calcium was lower in the third records as compared with the first records, indicating an improvement in the diets of Group I. This is also true for the other food components. The improvement again was not nearly as striking in Group II (Table VI).

From the records of 355 teachers in Group I who completed the study it was found that 236, or 66.5%, were absent during the year previous to the commencement of the study, whereas 65.6% of Group II were absent during the same period (Table VII). In other words, the absence rate for the two groups in the year previous to the study was very similar. The average number of days absent for each teacher

was 3.7 in Group I and 4.0 in Group II for that period.

As will be seen from Table VIII, during the twelve months of study, of 355 teachers in Group

TABLE V.

PERCENTAGE OF TEACHERS BELOW A MINIMUM
DAILY INTAKE OF CERTAIN FOOD ELEMENTS
GROUP I (DIET)

	1st record	2nd record	3rd record
Protein—below 60 grams.....	27.0	14.8	11.2
Calcium—below 0.8 grams.....	51.8	30.0	32.9
Iron—below 10 mgm.....	5.9	4.5	3.75
Vitamin A—below 5,000 units...	42.5	12.3	21.5
Vitamin B ₁ —below 500 units...	83.6	63.0	48.1
Vitamin C—below 50 mgm.....	22.1	23.7	2.5
Vitamin B ₂ —below 2.0 mgm....	71.7	49.3	53.0

TABLE VI.

PERCENTAGE OF TEACHERS BELOW A MINIMUM
DAILY INTAKE OF CERTAIN FOOD ELEMENTS
GROUP II (PILLS)

	1st record	2nd record	3rd record
Protein—below 60 grams.....	27.0	14.8	11.2
Calcium—below 0.8 grams.....	56.0	40.2	45.2
Iron—below 10 mgm.....	15.0	5.8	4.7
Vitamin A—below 5,000 units...	39.8	14.7	22.9
Vitamin B ₁ —below 500 units...	87.8	64.6	66.3
Vitamin C—below 50 mgm.....	22.4	22.6	12.9
Vitamin B ₂ —below 2.0 mgm....	77.4	60.8	69.1

TABLE VII.

RECORD OF ABSENCE DURING PREVIOUS YEAR

	Group 1 (Diet)	Group 2 (Pills)
Number of teachers reporting....	355	372
Number of teachers absent.....	66.5%	65.6%
Total days absent.....	1,324.5	1,495.5
Days absent per teacher.....	3.73	4.02

TABLE VIII.

RECORD OF ABSENCE DURING YEAR OF OBSERVATION

	Group 1 (Diet)	Group 2 (Pills)	Group 3 (Controls)
Number of teachers re- porting.....	355	379	293
Number of teachers absent..	64%	67%	66.2%
Total days absent.....	1,188.5	1,483.5	1,096
Days absent per teacher....	3.35	3.91	3.74

I, 64% were absent, while of 379 teachers in Group II, 67% were absent. The teachers in Group I were absent a total of 1,188.5 days, which was 136 days less than the previous year, whereas 379 teachers in Group II were absent 1,483.5 days, which is almost the same as during the previous year. The average number of days

absent in Group I was 3.3, as compared with 3.7 the previous year, and compared with an average of 3.9 in Group II. The improvement in Group I, the improved-diet group, is slight and not very significant.

It is interesting to note that in Group III—teachers who took no part in this study until May, 1942, when they kept dietary records and reported illness and absence during the previous year, that is, the period corresponding with the year of observation for Groups I and II—66.2% of teachers were absent from school, the average number of days absent being 3.7 per teacher, which is slightly better than Group II, and not quite so good as Group I. Again, the difference is very slight.

Table IX shows that 356 teachers in Group I reported 497 colds, while 381 teachers in

TABLE IX.

INCIDENCE OF COLDS AND RELATED DISEASES

	Group 1 (Diet)	Group 2 (Pills)	Group 3 (Controls)
Number of teachers re- porting.....	356	381	293
Number of teachers with colds.....	74%	78%	60%
Total number of colds.....	497	615	305
Number of colds per teacher	1.39	1.61	1.04

Group II reported 615 colds; that is, 74% in Group I and 78% in Group II. The records of those in Group III, the control teachers, showed only 60% with colds during the year. The average number of colds per teacher in Group I was 1.39, in Group II, 1.61, and in Group III, 1.04. It is felt that there is little if any significance to be attached to the difference in Group I and Group II. The difference in Group III might possibly be explained by the fact that the teachers in this group were trusting to memory for their record for the previous year, whereas Group I and Group II had been asked to keep an accurate record during the year.

Table X shows that 61.4% of the teachers in Group I had dental fillings during the 12 months previous to the study, compared with 64.6% of the teachers in Group II. The average number of fillings per teacher was 1.79 in Group I, and 1.77 in Group II. During the year of observation, only 49% of the Group I teachers had fillings, compared with 55.8% of Group II, and 62.4% of Group III (Table XI). This seems to be of some significance. It is further illustrated by the fact that the total number of

TABLE X.
DENTAL RECORD DURING 12 MONTHS
BEFORE OBSERVATION

	Group 1 (Diet)	Group 2 (Pills)
Number of teachers reporting.....	322	328
Number of teachers had fillings.....	61.4%	64.6%
Total number of fillings.....	577	581
Number of fillings per teacher.....	1.79	1.78

TABLE XI.
DENTAL RECORD DURING 12 MONTHS
OF OBSERVATION

	Group 1 (Diet)	Group 2 (Pills)	Group 3 (Controls)
Number of teachers re- porting.....	322	328	280
Number of teachers had fillings.....	49%	55.8%	62.4%
Total number of fillings....	423	450	476
Number of fillings per teacher.....	1.31	1.37	1.7

fillings in Group I was reduced from 577 in the year previous to study to 423 during the year of study. In Group II it was reduced from 581 to 450. It is interesting to note that Group III, the control group, in which there were a hundred fewer teachers than in the other two groups, required 476 fillings, which is more than either of the other groups. The average number of fillings per teacher was 1.31 in Group I, 1.37 in Group II, and 1.7 in Group III. This would suggest an improvement in the dental health of the teachers of both Groups I and II over the previous year, and also in comparison with Group III.

The interpretation of the meaning of the decrease in the number of new cavities in the teeth during the year of observation of those in Groups I and II is not easy. The possibilities are (1) that the records for the year of observation were more accurate because the teachers knew that they were to report; (2) that the teachers went to the dentist less because of war conditions and other pressure on their time, and (3) that the reduction represents accurately the situation, whether or not it was associated with nutritional improvement. The fact that the control group, Group III, is similar to the previous year of the other two groups suggests that reduced visits to the dentist were not an important factor, leaving us with the conclusion that the dental health of the teachers was slightly improved.

Table XII.—In the questionnaire which was sent to each teacher at the end of the year of

study, the following question was asked, "Do you feel that your general health has improved, become worse, or remained the same during the past year?" In Group I, 40% felt that their health was better; in Group II, those taking pills, 61% thought that their general health was better.

TABLE XII.
STATE OF GENERAL HEALTH DURING PERIOD OF
OBSERVATION (TEACHERS' OWN OPINION)

	Group 1 (Diet)	Group 2 (Pills)
Better.....	40%	61%
Same.....	56%	35%
Worse.....	4%	4%

DISCUSSION

The dietary habits and nutritional level of the Toronto school teachers are apparently sufficiently high that no marked improvement in the records of health could be shown by improvement of diet or by supplementing the diet with vitamin-mineral pills. The difference between the dietary level before and after advice was given, and in comparison with the dietary level of those who did not receive advice was not very great. No attempt was made to take into consideration the body build, age, sex or individual requirements or to adjust the standards in any way, so that it is probable that some teachers who received a low rating were taking a diet adequate for their needs but which did not meet the requirements laid down at the beginning of the study.

Whether the greater improvement in general health as reported by the group taking vitamin-mineral pills was real or due to psychological impressions, it was not borne out by the actual records of illness suffered.

It should be pointed out that this was a purely dietary survey and lacked any specific means of examination. The teachers were not medically examined or interviewed, and remained anonymous throughout. It is possible that had some of the newer methods of scientific examination and assessment of nutritional state been available, perhaps measurable changes could have been shown. Perhaps a longer period of preparation, say one year, of improving the dietary habits—before starting to take records of illness—would produce more striking results.

The food diaries compiled during the year of study have furnished valuable information which has been of national service.

SUMMARY

A dietary survey of a group of Toronto school teachers revealed a fairly high standard of food intake.

Some improvement in dietary habits was obtained in one group, as shown by analyses of weekly dietary records at three periods during the year by pointing out deficiencies to the individual.

No marked improvement was shown by the records of illness or absence from teaching duties, either as a result of improved diet or as a result of taking a vitamin-mineral preparation daily.

The number of new dental cavities was slightly reduced in the group with improved diets and in the group taking a vitamin-mineral preparation in comparison with their records for the year previous. The records of a group of control teachers showed a higher incidence of dental cavities.

A higher percentage of the teachers who received the vitamin-mineral preparation reported their general health to be improved.

We wish to acknowledge the assistance of Miss Dorothy G. Wiehl, Milbank Memorial Fund, New York, in planning this study and to thank her for her helpful suggestions and criticisms.

SOME OBSERVATIONS OF MOTION AT THE SHOULDER JOINT*

By Guy H. Fisk, M.D.

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A PERUSAL of the current textbooks and recent articles on the shoulder joint leaves the reader with a confused impression of the process involved in the normal movements of the shoulder. So much attention is given to the movement occurring at the scapulo-humeral joint that the reader gains the impression that the movements of the scapula, clavicle, and the sternum are of no importance. Martin,¹ for example, believes that the humerus is capable of rotating through 170 degrees at the scapulo-humeral joint. It is my purpose in this paper to show that practically 50% of the movement at the shoulder joint occurs as a result of the

movements of the scapula and clavicle. The scapulo-humeral joint is thus responsible for only half the movement occurring at the shoulder. The movements of the bones forming the shoulder joint were elucidated by a study of the shoulder under a fluoroscope. X-ray films were taken in eight key positions to demonstrate all the points seen.

In order to be sure of the exact position of the humerus the elbow was flexed to a right angle, as this at once eliminated any errors in palpation of the condyles of the humerus. In order to check on the positions of the bones as seen in the x-ray films specimens of the humerus, scapula, and clavicle were examined under the fluoroscope until the exact position and configuration seen in the plates were reproduced. The subjects used for this project were three young, healthy women. Since the results checked to within five degrees, a description of the average results will be presented. The relationship of the bones in the eight key positions provides a complete picture of the movements possible at the shoulder joint.

Position 1 is the supine position of the anatomist; to the radiologist it is the position of external rotation. In this position the individual has the arm and forearm by the side, the hand faces forward, if the elbow is flexed to a right angle the fingers point directly anteriorly. The x-ray of this position is shown in Fig. 1. The humerus lies in external rotation, with the greater tuberosity forming its lateral border. The acromion process of the scapula is above and slightly behind the head of the humerus, while the anterior border of the glenoid cavity slightly overlaps the medial aspect of the humeral head. The medial angle of the scapula projects just above the medial half of the clavicle. The root of the spine of the scapula is horizontal and the vertebral border is vertical. The inferior angle of the scapula is level with and, in some cases, just behind the eighth rib. The clavicle is almost horizontal, while the top of the manubrium of the sternum is level with the upper half of the third thoracic vertebra.

Position 2 is that of full external rotation with the arm at the side. To attain this the forearm was bent at a right angle and the arm rotated externally as far as possible, with the elbow touching the chest wall. By measurement it was found that the arm rotated fifty degrees externally from position 1. The x-ray of this

* From the Physiotherapy Department of the Montreal General Hospital. This work was made possible by the grant from the Cooper Fund of the Faculty of Medicine of McGill University.

position is shown in Fig. 2. The humerus appears in extreme external rotation, the lesser tuberosity now forming the lateral border of the head of the humerus. This position of the humerus is attained not by further rotation of the humerus on the scapula, which never exceeds that seen in position 1, but by rotation of the scapula on a vertical axis. The articular surface of the glenoid cavity is angled posteriorly; the coracoid process is elongated and the acromion process shortened. The vertebral border of the scapula has moved medially about one centimetre. This rotation of the scapula about a vertical axis amounts to twenty degrees.

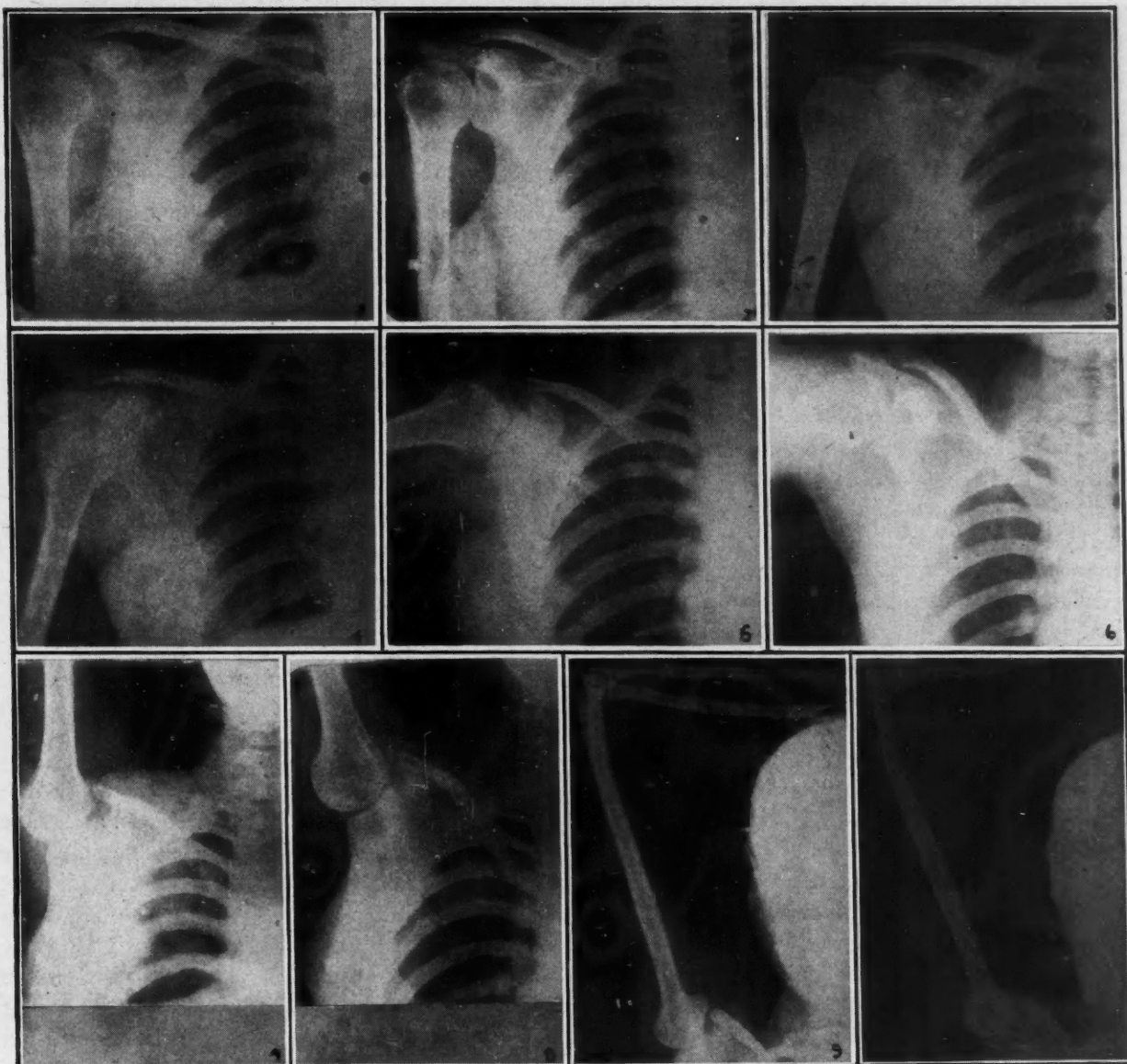
Position 3 is that of internal rotation, with the arm and forearm by the side. The palm of the hand faces backwards and is considered by radiologists in general to be the best position for an "internal rotation picture" of the humerus. Flexion of the elbow to a right angle is impossible in this position, as the forearm comes up against the body. This position is by no means full internal rotation of the arm. The x-ray of this position is shown in Fig. 3. The humerus is internally rotated on the scapula so that the lesser tuberosity forms its medial border, a rotation from position 1 of ninety degrees internally. The scapula has rotated about a vertical axis some ten degrees. The tip of the acromion process is further from the tip of the coracoid process than in position 1, and the glenoid cavity faces slightly antero-laterally. This movement represents the end of the scapulo-humeral joint action in internal rotation as the next position shows.

Position 4 is one of full internal rotation, and is obtained by flexing the forearm to a right angle and placing it behind the back, the arm meanwhile being kept close to the side. Fig. 4 shows the x-ray of this position. This shows that the medial border of the head of the humerus is now formed by the lateral ridge of the lesser tuberosity. The medial ridge of the greater tuberosity forms its lateral border. The scapula has rotated about a vertical axis so that the coracoid process is almost antero-posterior, and the glenoid process faces antero-laterally. The blade of the scapula is foreshortened, its width being reduced about two centimetres in the picture. It is thus seen that while the arm has gone through 110-degree internal rotation from position 1, its components the scapula and humerus have rotated, respectively, through 30 and 80 degrees.

Since the scapula carries the humerus with it, the apparent rotation of the humerus is increased from 90 degrees to 140 degrees in going from full external rotation in position 2 to full internal rotation in position 4. Only 90 degrees of this movement occur at the scapulo-humeral joint. It was further found that full extension of the shoulder produces internal rotation of the scapula and humerus. It is impossible to obtain full extension at the shoulder with the arm in the sagittal plane, unless this internal rotation has occurred.

Position 5 is with the arm abducted or raised sideways to 90 degrees, the forearm flexed at the elbow to a right angle, and raised vertically so that the fingers point directly upwards. This is full external rotation with the arm in the abducted position. The x-ray of this position is shown in Fig. 5. This shows the scapula rotated through an antero-posterior axis of twenty degrees with the vertical, the medial angle of the scapula has moved downwards to the level of the upper border of the third thoracic vertebra, with the tip just medial to the first rib. The anterior border of the acromion process points upwards, the scapula being rotated through a coronal axis at about the level of the root of the scapula spine in such a way as to tip its upper part backwards. The acromion process is thus posterior to the head of the humerus. The glenoid process faces laterally and upwards. The humerus is abducted and externally rotated, the lesser tuberosity being superior. The clavicle is angled upwards at the sterno-clavicular joint to form a 25 degree angle with the horizontal.

Position 6 is with the arm abducted or raised sideways to 90 degrees, and the forearm flexed to a right angle at the elbow, and turned downwards so that the fingers point directly down. This is full internal rotation, with the arm in an abducted position. The x-ray of this position is shown in Fig. 6. The vertebral border of the scapula is still at an angle of 20 degrees with the vertical. It has rotated about a coronal axis in such a way as to bring its medial angle upwards and forwards to just behind the transverse process of the seventh cervical vertebra. The glenoid cavity faces laterally, upwards and forwards. The anterior border of the acromion faces forwards. The humerus is abducted and internally rotated, the lesser tuberosity being inferior. The clavicle is angled upwards at the sterno-clavicular joint to 45 degrees with the



horizontal. In order to attain this position from position 5, the humerus has rotated through 90 degrees, and the scapula through 70 degrees. The whole range of this movement is 160 degrees.

Position 7 is with the arm elevated above the head vertically. The elbow is flexed to a right angle and the forearm and arm rotated so that the hand points as far posteriorly as possible. The humerus is kept vertical. This is full external rotation with the arm elevated, and can be reached by simple elevation of position 2 through 180 degrees. The x-ray of this position is shown in Figs. 7 and 9. This shows the scapula rotated about an antero-posterior axis, the glenoid cavity faces laterally and upwards, now forming a 55 degree angle with the vertical. The medial angle of the scapula is level with the body of the fourth thoracic vertebra and at the lateral border of the first rib. At the same

time the scapula has rotated about a coronal axis in such a way as to bring the acromion process directly posterior to the head of the humerus, with its anterior border facing upwards and medially. It should be noted that there is no bony obstruction to further elevation of the humerus, as has been postulated by some authors, and that the humerus must be arrested by muscular and ligamentous action. The position of the acromion process in Fig. 5 also emphasizes this point. In position 7 the humerus is in external rotation, the lesser tuberosity being medial. The clavicle is at a 45 degree angle with the horizontal. The upper border of the manubrium of the sternum is depressed from its position at the level of the disk between the third and fourth thoracic vertebrae.

Position 8 is similar to position 7 except that the arm and forearm have been internally

rotated. That is, while the upper arm is kept vertical and the elbow at a right angle, the arm is rotated so that the hand points as far forward as possible. There are only 10 degrees of movement possible from position 7, after which the humerus is forced downwards. The x-ray of this position is seen in Figs. 8 and 10. All the movement in this position occurs by rotation of the scapula through a coronal axis and it carries the humerus with it. The medial angle of the scapula is brought upwards and medial to the inner border of the first rib.

From these observations made on the living person it can be seen that the range of movements at the scapulo-humeral joint is much more limited than is commonly supposed. No matter what the starting position or direction of travel, when the arm was vertically elevated, the humerus always went into full external rotation in relation to the scapula. Likewise the scapula undergoes rotation in an antero-posterior and a coronal plane. The scapular movement occurs during the movement from abduction of 90 degrees to full vertical elevation.

At the scapulo-humeral joint the movements are limited to rotation of 90 degrees with the arm by the side, rotation of 90 degrees with the arm abducted, no movement at all with the arm vertically elevated, abduction of 90 degrees in the coronal plane and the elevation of 90 degrees in the sagittal plane.

Movement of the scapula is almost as extensive.

There is rotation about an antero-posterior axis which forms a component of full elevation, abduction, and extension of the arm, rotation about the coronal axis which forms an important part of the movements of internal and external rotation.

This coronal rotation appears to take place at or just below the root of the spine of the scapula. The clavicle rotates on the sterno-clavicular joint, increasing its angle with the sternum from 90 degrees to 145 degrees. The clavicle also rotates about a longitudinal axis at the sterno-clavicular joint.

One final interesting point was the movement of the sternum downwards for about one centimetre in the positions where the arm is abducted or elevated above a right angle. Evidently the sternum is a fulcrum which sustains a considerable thrust in these positions. The rotation of the clavicle at the sterno-clavicular probably also explains the resemblance of this joint to the temporo-mandibular joint in construction. The

full sterno-clavicular joint movements comprise angulation in the antero-posterior and vertical planes with rotation about the longitudinal axis of the clavicle.

I wish to thank Dr. J. W. Mackay, Radiologist to the Montreal General Hospital, for his valuable help and assistance. Thanks are also due to Dr. L. Ritchie, Radiologist of the Montreal General Hospital for permission to use the facilities of the X-ray Department of the Montreal General Hospital for the work, and to my technicians who acted as the subjects for this work.

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CONSERVATIVE SURGICAL TREATMENT OF CHRONIC INVERSION OF THE UTERUS

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THERE are several surgical methods of treating chronic inversion of the uterus, and these may be divided into two groups, namely, the vaginal method and the abdominal method. The commonest abdominal method is the Haultain technique. This procedure includes cutting the posterior ring of the inversion from within the abdominal cavity and then gradually replacing the uterus by means of Allis forceps, along with some pressure upon the fundus of the uterus from the vagina. The vaginal methods of surgical management include two common procedures, the conservative method known as the Spinelli operation and the radical method of vaginal hysterectomy.

The conservative surgical treatment known today as the Spinelli operation was first done by G. Spinelli, of Naples, January 15, 1899, and reported before the 13th International Congress of Medical Science in Paris, August, 1900. Up to that time only 11 cases had been published which had been treated by conservative vaginal surgery. Those 11 cases were as follows: Küstner (1893); Robb (1895); Salin (1895); Iosephson (1895); Morisoni (1896); Sava (1897); Westmark (1897); Duret (1898); Porlis (1898); Kehrer (1898); Spinelli (1899).

Some of the cases prior to Spinelli were surgically treated in the same manner as Spinelli

described in 1899. Iosephson's attempt was not a success and Küstner's incision, not being long enough, he had to remove the uterus. Spinelli used a modification of the Kehrer operation on a chronic inversion of 4 years' standing, with an excellent result. Spinelli called his operation *colpo-hysterotomie antérieure*, and a better name could not be found, as it designates exactly what was done. The detailed description

CASE 1

Mrs. B., aged 29, para-3. This patient was born in Scotland and came to Canada in 1924 just after her marriage. Her first baby was born in Ottawa in 1925. The pre-natal period and labour were normal. Her second baby was full-term and born spontaneously in London in 1927. Her third baby was born in March, 1929. Following the birth of this baby the following note appears on her obstetric chart, "On expression of the placenta by Crede's method it was found that the placenta seemed to be adherent. On using traction, evidently on the cord, a mass was brought down the size of an adult fist, and the placenta and mem-

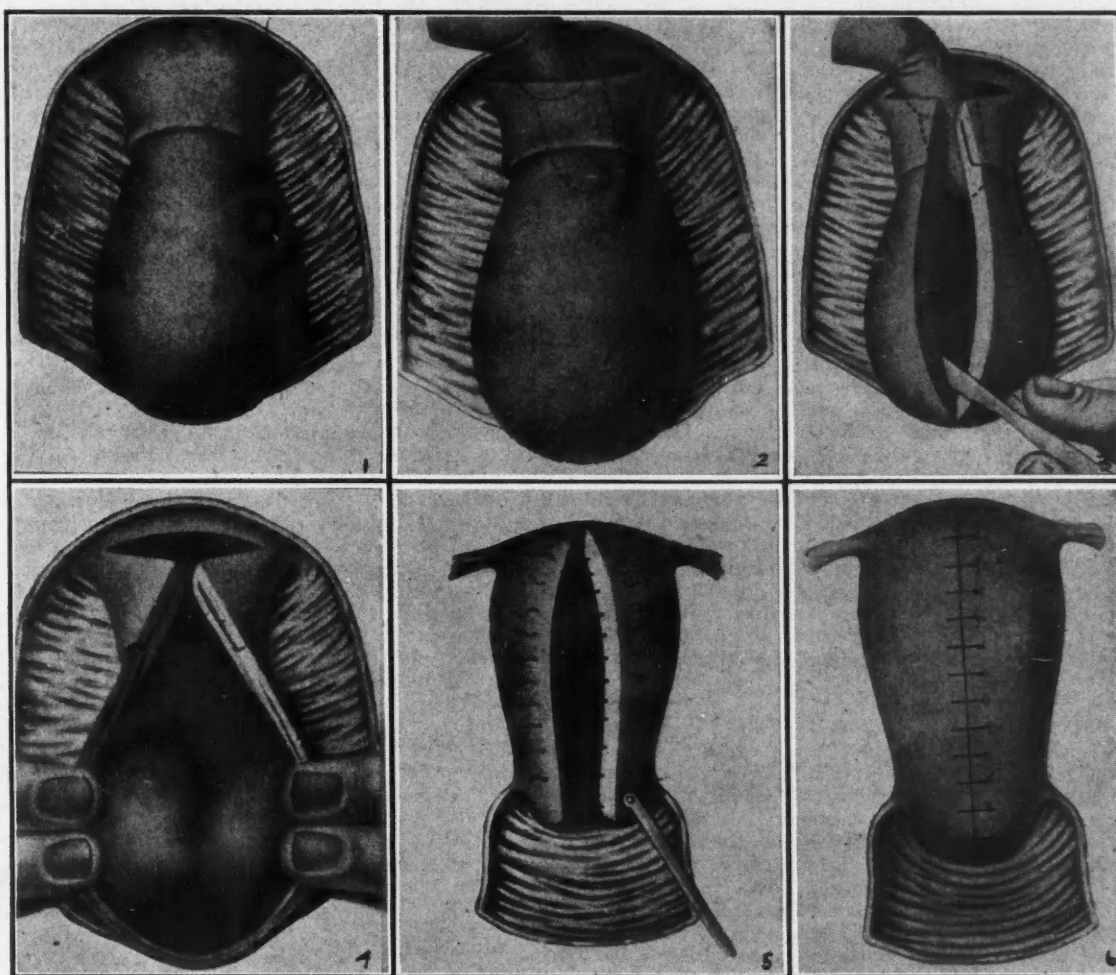


Fig. 1.—Inversion utérine. Fig. 2.—Colpocœliotomie antérieure. L'index insinué par l'incision vaginale pénètre dans l'infundibulum utérin. Fig. 3.—Incision de la paroi antérieure de l'utérus intéressant toute son épaisseur. Fig. 4.—Manœuvre de la réinversion de l'utérus. Fig. 5.—L'utérus est réduit. Placement des fils de suture. Fig. 6.—Utérus suturé.

of his operation as appears in the *Annales De Gynécologie*,¹ is clear and complete in every way.

The following photographs are copies of Spinelli's original photographs as they appeared in the *Annales De Gynécologie*. These diagrammatic photographs describe very clearly the essential steps of his operation.

I have had the opportunity to carry out the Spinelli operation on two cases of chronic uterine inversion and would like to report these two cases briefly as follows.

branes were peeled off the protruding mass. This mass, which protruded into the vagina, was diagnosed as a pedunculated fibroid growing from the posterior wall of the uterus." The baby was born 2½ hours after her pains started and the placenta was manually delivered 45 minutes after the birth of the baby. The report also states that this patient's own doctor was unable to attend her at the confinement and she was attended by another physician who has since died, and therefore it is not actually possible to get all the details of the placental delivery. There was an abnormal amount of bleeding after the placenta was peeled off. The patient was given pituitrin and ergot and was also packed tightly *per vaginam*. She was returned to her bed in fair condition, but with a fast and rather weak pulse, according to the nurse's note,

The vaginal bleeding gradually decreased but was more profuse and a brighter red than it should be throughout the next two weeks. Eleven days after confinement she was passing an occasional blood clot. The temperature ranged between 99 and 100° during her stay in the hospital and the pulse was between 90 and 120. This patient was discharged from the hospital 12 days after confinement.

I have no further accurate records of this patient until she appeared at the Gynaecological Out-Patient Department of Victoria Hospital in February, 1931, complaining of "something coming down" and prolonged periods. My colleague, Dr. F. R. Clegg, saw her and sent her into the indoor service with a diagnosis of chronic inversion of the uterus. I saw her the day after admission and found she was just beginning a menstrual period. We had the opportunity of actually visualizing the interior of the uterus weeping droplets of blood, because the uterus partly protruded outside the vulva during her menstrual periods. Between periods the patient said the mass would disappear. After the period was over I examined her and found a complete chronic uterine inversion. This uterus had been inverted for a little over two years and, therefore, I decided to do one of two things: (a) the Spinelli operation, or (b) a vaginal hysterectomy.

The Spinelli operation was carried out without difficulty on March 12, 1931. I did not use drainage and she made a splendid recovery. Her temperature was 100° the day after the operation, and on the 3rd day it was 99° and pulse, 84. At the end of the first week after operation the temperature was normal and the pulse between 70 and 80. The patient was discharged from the hospital 21 days after operation. Her menstrual period returned on time and continued normally. I advised the patient to avoid a pregnancy if possible for about a year after her operation. She had three girls and was very anxious for a boy, and two years after her operation I confined her with her fourth baby in 1933. She had an easy spontaneous labour and got her boy. Seven years later in 1940 I confined this patient again. This labour was also normal; she is now 41 years old and her periods are perfectly normal and her pelvis in excellent condition.

CASE 2

Mrs. W.P.Mc., aged 21, para-1. This patient was confined with her first baby in St. Joseph's Hospital, Chatham, October 19, 1942. It was a breech delivery, and the baby weighed 7 lb. 9 oz. The delivery was a normal spontaneous breech, seemingly without any serious difficulty whatsoever. When the placenta came away, the inverted uterus appeared with it. This was no doubt a spontaneous inversion. The vagina was packed tightly with sterile gauze, to control the bleeding after a futile attempt had been made to re-invert the uterus. The bleeding continued even through the packing, so the patient was given a blood transfusion of 750 c.c. of whole blood at 3 p.m. October 19, about 8 hours after delivery. She was given a second transfusion the following day and a 3rd one the end of the week after her labour. The vaginal packing was removed on the 5th day after labour. The bleeding subsided and the patient went home from the hospital 14 days after her confinement. After being home 5 days she began to flow quite badly and required several blood transfusions over the next few days, besides vaginal packing. One month after her labour I saw her in consultation. She had a complete inversion of the uterus, which was not fully involuted and was still bleeding a little. Under nitrous oxide anaesthesia I attempted to manually re-invert the uterus and found it impossible and also dangerous to try. Without too vigorous manipulation of the inverted uterus the patient's pulse would rise very rapidly. No further attempt was made. The bleeding subsided considerably after several days' rest in bed and the patient was sent home for a month or six weeks in order to allow the uterus to involute more completely. During this time, of course, the patient was resting off her feet most of the time and was also

receiving fairly large helpings of iron with some liver. Her diet was as full as possible.

She returned to Victoria Hospital, February 1, 1943, when I found the uterus quite well involuted. There was still a little more or less constant bleeding, but not profuse. She had the typical waxy, pale appearance of a patient who had lost considerable blood over a period of weeks. The haemoglobin was 58% and the red count was 2,930,000. I proposed now to go ahead and if possible do one of two operations for her: (a) the Spinelli operation, or (b) the Haultain, if the Spinelli could not be done. I was naturally very anxious to preserve the uterus on account of her age, and therefore, decided that a hysterectomy must only be done if the conservative operations were found out of the question. The Haultain operation involves an abdominal incision, and this girl was really not in good condition for an abdominal operation, particularly one which might involve a fair amount of time and considerable manipulation of the inverted uterus. I, therefore, had decided at the outset to do the Spinelli if at all possible. The one chief feature, of course, which would make the Spinelli difficult would be the inaccessibility of the anterior colpotomy area where one would be doing the first and more difficult part of the operation.

On February 5, 1943, I was able to carry out the Spinelli operation without serious difficulty, although technically it was more difficult than in case 1 because the operative field was not so readily accessible. I used a small rubber drain in the colpotomy wound and an inlying catheter in the bladder. The cavity of the uterus was firmly packed with sterile gauze, at the end of the operation. I removed the drain, inlying catheter and the uterine packing on the 4th day after operation. The temperature touched 101° the evening of the 4th day, and the following day it was down to almost normal, with a good pulse of about 80. She voided voluntarily after the catheter was taken out. Seventeen days after the operation the patient said she felt that she was going to have a menstrual period, and the next day her menstrual flow began. It was fairly normal, but lasted about seven days instead of 5 or 6, as was usual for her. She left the hospital 23 days after her operation in excellent condition. The pelvic examination was very satisfactory; the haemoglobin was 72%; and the red count 4,100,000. I advised this patient to avoid a pregnancy for a year and to report to her family physician periodically.

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"Research is a gamble. It cannot be conducted according to the rules of efficiency engineering. . . . Research must be lavish of ideas, money and time. The best advice that I can give is don't quit easily, don't trust anybody's judgment but your own; especially don't take any advice from any commercial person or financial expert, and, finally, if you really don't know what to do, match for it. . . . The best person to decide what research work shall be done is the man who is doing the research. The next best is the head of the department. After that you leave the field of best persons and meet increasingly worse groups. The first of these is the research director, who is probably wrong more than half the time. Then comes a committee, which is wrong most of the time. Finally there is the committee of company vice presidents, which is wrong all the time."—By Dr. C. E. K. Mees of Eastman Kodak (as quoted in "Tonics and Sedatives", *J. Am. M. Ass.*, January 8, 1944.)

**SOME STUDIES ON THE Rh FACTOR
AND ITS SIGNIFICANCE IN
OBSTETRICAL PRACTICE***

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MUCH experimental work has been done with the Rh factor. Its association with erythroblastosis foetalis, icterus gravis neonatorum, and fetal hydrops has been established. However, no work dealing with the Rh factor in a series of consecutive cases of pregnant women has been published. Previous reports have selected a group of erythroblastotic children and have established that there was a high percentage of Rh-negative mothers. This has led to the assumption by many that Rh-negative women are predestined to lose their children.

This preliminary series was studied in an attempt to find out if there were any significant differences in the outcome of pregnancies among Rh-positive and Rh-negative women.

The existence of the Rh factor was first demonstrated in 1940 by Landsteiner and Wiener^{1, 2} when they reported that immune sera produced in rabbits by the injection of blood from rhesus monkeys was capable of agglutinating the erythrocytes of certain human bloods. This property was termed by these workers the rhesus factor or, more simply, Rh. Individuals whose blood was agglutinated with this serum were termed Rh positive, the remainder being Rh negative.

Weiner and Peters³ reported 3 cases of transfusion reactions in which the same agglutinin was responsible. In these cases the recipients were Rh negative and received repeated transfusions of Rh-positive blood, eventually having severe or fatal reactions. By means of appropriate cross-matching technique it was demonstrated that these patients had developed anti-Rh agglutinins in their sera.

Subsequently in 1941, Levine, Vogel, Katzin and Burnham^{4, 5} demonstrated an association

between erythroblastosis and the Rh factor. They found that about 90 to 93% of erythroblastotic children were born to women who were negative for the Rh factor. In 1942, Javert⁶ postulated a lesion of the placenta and intra-placental haematoma as conditions which could provide for transmission of fetal blood to the mother, causing an immunization of the mother against the Rh-positive cells of the fetus.

The present series is a study of 474 consecutive cases entering the Royal Victoria Montreal Maternity Hospital for childbirth. They were examined in respect of the Rh factor, the A, B and O groups, and their previous obstetrical histories. The same blood determinations were made in the case of the husbands and children whenever possible. Unfortunately, because of the present international situation, it was sometimes impossible to obtain blood from the putative fathers.

Throughout this work standard sera supplied by the Certified Blood Donor Service in New York were used for determination of the blood groups and the Rh factor. For these determinations saline suspensions of cells of approximately 2% were used.

In determining the A, B and O groups an open slide technique employing slight agitation was found to be satisfactory. The serum-cell mixtures were allowed to stand, with mild mechanical agitation, for about 15 minutes before reading. All readings were done microscopically.

In testing for the Rh factor small serological test tubes of approximately 7 mm. inside diameter were used. One drop of cell suspension and one drop of the serum were mixed in the test-tube and placed in the incubator for 45 minutes, the test-tubes being stoppered to prevent evaporation. At the end of this time the mixture was centrifuged at 500 r.p.m. for about 3 minutes. The type of sediment was noted as suggested by Landsteiner and Wiener² and the cells resuspended by means of simple rotation in an almost horizontal position. A drop of the mixture was transferred to a microscope slide and the results read microscopically.

Blood was taken from the finger of the mother between 24 and 48 hours after delivery and at about the same time from the child. Blood from the husband was taken when he came to visit.

Whenever the mother and child were of different blood groups, except in the case of a group "O" child, and when the mother was

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Rh negative and the child Rh positive, appropriate titrations were done with the mother's serum against child or husband or both and against other known persons. Venous blood from the mother was used for this purpose.

When checking for Rh isoantibodies the tests were conducted at 37 and 7° C.

TABLE I.
DISTRIBUTION OF RH FACTOR IN THE PRESENT SERIES

	Rh+	Rh-	Total	% Rh-
Women.....	390	85	475	17.9
Men.....	241	39	280	14.0
Babies.....	382	53	435	12.2
All.....	1,013	177	1,190	15.0

RESULTS

In all 1,190 tests for the Rh factor were made, of these 177, or 15%, were Rh negative (Table I).

In both the Rh-positive and Rh-negative women the average number of pregnancies was the same, 2.8 and 2.6, respectively. Further, the percentage of deaths following the neonatal period were about the same in both groups of women—2.8 and 3.1% (Table II). It is interesting to note that in 13% of the 1,081 total pregnancies in Rh-positive women the result was either an abortion, miscarriage, or a fetal death, whereas in the Rh-negative group 21% of the 223 pregnancies ended similarly.

TABLE II.
RESULTS OF 1,304 PREGNANCIES IN 474 WOMEN

	Rh+	Rh-
Women investigated.....	389	85
Number of pregnancies.....	1,081	223
Average number of pregnancies....	2.8	2.6
Living children.....	913	173
Abortions, miscarriages, fetal deaths	144	47
	(13.3%)	(21.1%)
Deaths after neonatal period.....	31	7
	(2.86%)	(3.1%)
Twins.....	9	4

Table III distinguishes between those women in the two groups who had some obstetrical trouble and those who had all children living.

The average number of pregnancies among those women, all of whose pregnancies terminated successfully, was about the same in both the Rh-positive and the Rh-negative groups (about 2), while in those women having fatal results there was an average of 4 pregnancies in each group.

Of the 389 Rh-positive women examined, 89, or 23%, had miscarriages, abortions, etc., and

in the Rh-negative group 23 of the 85, or 27%, had similar complications. On the other hand, of 412 pregnancies among the 89 Rh-positive women 144, or 35%, terminated unfavourably and of the 94 pregnancies in Rh-negative women 47, or 50%, had the same result.

TABLE III.
COMPARATIVE RESULTS IN RH-POSITIVE AND RH-NEGATIVE WOMEN

Group	Number of women	Pregnancies	Miscarriages, abortions, etc.	Average No. pregnancies
Rh-positive women	300	669	0	2.2
	89 (22.9%)	412	144 (34.9%)	4.6
	389	1,081	144	—
Rh-negative women	62	129	0	2.1
	23 (27.1%)	94	47 (50.0%)	4.1
	85	223	47	—

TABLE IV.
INCIDENCE OF TOXÆMIA IN RH-POSITIVE AND RH-NEGATIVE WOMEN

	Total	Normal	Toxic	% Toxic
Rh-positive women..	376	337	39	10.4
Rh-negative women..	74	66	8	10.8
	450	403	47	10.4

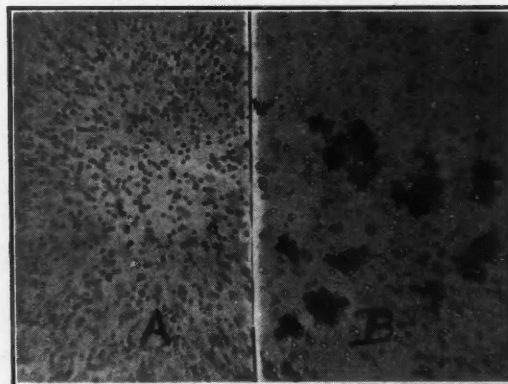


Fig. 1.—Photomicrograph of Rh-positive and Rh-negative bloods with anti-Rh serum. A Shows a negative reaction to anti-Rh serum. All cells are free in the suspension. B Shows the reaction of Rh-positive blood to anti-Rh serum. A great proportion of the cells are tightly clumped.

In Table IV are listed the number of Rh-positive and Rh-negative women, who, in the present series only, had toxæmia or were placed on a toxic regimen. It is of particular interest to note that there is no significant difference.

Of the 85 Rh-negative women, 34 had babies which were negative for the Rh factor (Table V). In 8 other mothers titrations for the anti-

Rh agglutinins were not done. Of the remaining 43 women, 10 had no demonstrable anti-Rh agglutinins in their sera at either 7° C. or 37° C. The remaining 33 all had demonstrable agglutinins at either one or both of these temperatures, ranging from titres of 1:1 to over 1:512. Of these, 20 had demonstrable anti-Rh agglutinins at 37° C, 3 of which had no demonstrable agglutinins at 7° C. At 7° C. agglutinins could be demonstrated in 30 sera, 13 giving no reactions at 37° C.

TABLE V.

REACTION OF SERA FROM RH-NEGATIVE MOTHERS WITH KNOWN RH-POSITIVE CELLS

Rh-negative women.....	85
Rh-negative babies.....	34
Not tested.....	8
Tested.....	43
No agglutinins 7° or 37°.....	10
Agglutinins at 37° C:—	
At 37°.....	20
Not 7°.....	3
Agglutinins at 7° C:—	
At 7°.....	30
Not 37°.....	13

CASE REPORTS

CASE 1

Mother group "A", Rh-negative. Husband group "A", Rh-positive. Mother, Kline negative.

Preg.	Year	Course	Maturity	Result
1.	....	Normal	Full term	Living
2.	1942	Incomplete abortion	4 months	.....
3.	1943	Normal	Full term	Died in 15 hours. Intracranial hæmorrhage. Erythroblastosis

Anti-Rh titre 1:256.

This patient received a transfusion at the time of the abortion in the second pregnancy and had no reaction. Either the patient did not have any anti-Rh agglutinins at this time, or by mere chance received an Rh-negative blood.

CASE 2

Mother group "A", Rh-negative. Husband group "O", Rh-positive. Mother, Kline negative.

Preg.	Year	Course	Maturity	Result
1.	1930	Normal	Full term	Good. Living. Rh-pos.
2.	....	Normal	Full term	Lived one month
3.	1938	Normal	Full term	Stillborn
4.	....	Normal	Full term	Stillborn
5.	1943	Normal	Full term	Deadborn, macerated, cedematous fetus. Intrauterine asphyxia. Erythroblastosis.

Anti-Rh titre 1:512.

In this case the breast milk had an anti-Rh titre of over 1:512.⁷

CASE 3

Mother group "A", Rh-negative. Husband group "O", Rh-positive. Mother, Kline negative.

Preg.	Year	Course	Maturity	Result
1.	....	.....	Full term	Living. Now 16 years old
2.	....	.....	Full term	Living
3.	....	.....	Full term	Living. Now 8 years old
4.	1943	Hydramnios	7 months	Cyanosed after feeding. Not nursed. Died in 4 days.

Anti-Rh titre 1:16.

CASE 4

Mother group "B", Rh-negative. Husband group "O", Rh-positive. Mother, Kline negative.

Preg.	Year	Course	Maturity	Result
1.	....	.....	8 months	Good. Now 7 years old
2.	....	.....	8 months	Good
3.	....	.....	.....	Good. Now 5 years old
4.	....	Breech	.....	Lived 2½ days
5.	1940	.....	Full term	Died in 12 hours. Intracranial hæmorrhage. Erythroblastosis
6.	....	.....	.....	Deadborn
7.	1942	Pre-eclampsia	26 weeks	Deadborn, macerated fetus. Intrauterine asphyxia. Edema of scalp
8.	1943	Normal	Full term	Died 4 hours. Erythroblastosis. Rh-pos.

Anti-Rh titre 1:512.

The pathological findings in this case were as follows:—The placenta was abnormal showing many closely packed, very cellular villi; nucleated red cells were found in the placenta and cord blood. The fetus contained a large number of hæmatopoietic foci in the liver, spleen and lungs. The liver and spleen were grossly enlarged.

CASE 5

Mother group "A₂", Rh-positive. Husband group "A₁", Rh-positive. Mother, Wassermann-negative.

Preg. 1. Anæmia. Full term. Deadborn erythroblastosis.

This is the only one of the 4 cases of erythroblastosis in the present series in which the Rh-factor was not the causative agent. In this case there was marked evidence that the fetus may have inherited an "A₁" factor from the father, this factor in turn causing immunization of the mother. This patient first came to our attention in the prenatal period when it was decided to give her a transfusion. Of a number of bloods tested, including that of the husband, only one would match.

SUMMARY OF RESULTS

In the present series all the cases mentioned as having abortions or miscarriages had these in previous pregnancies. The cases considered here are only those entering the hospital for childbirth some time after the seventh month.

There is little doubt in the minds of the writers that if cases of abortions and miscarriages had been included in this series the figures derived would probably have been somewhat different. It is evident, however, that these figures are significant and point the way to new fields of investigation.

It is evident that an Rh-negative woman is not, in her first 2 or 3 pregnancies at least, particularly more apt to lose her child either before or during birth or in the neonatal period than an Rh-positive woman. In the case of repeated pregnancies there is a significantly higher incidence of fetal mortality among the Rh-negative women.

Table III points out that in both groups the average number of pregnancies among women having fetal mishaps is almost double that among those women having all living children. It is important to note the marked difference in the results of these pregnancies. In the Rh-positive group 35% of the pregnancies ended fatally as compared with 50% of the pregnancies in the same group of Rh-negative women. However, in the present series there were several cases of Rh-negative women whose husbands were Rh-positive with 7 or more living children, or whose children died from sickness or accident following the neonatal period. In these cases one or more of the children were Rh-positive.

We found the sera of Rh-negative mothers to react with Rh-positive bloods more frequently at the cooler temperature (7° C.) than at body temperature. While some of these may possibly be explained by the presence of "cold agglutinins", it seems likely that the agglutinins in question are Rh isoantibodies.

In this series there were only 4 erythroblastic children one of which (case 5) was not associated with the Rh factor but was apparently the result of isoimmunization of an A₂ mother against A₁ cells inherited by the fetus from the father.

CONCLUSIONS

1. The percentage distribution of the Rh factor in this series compares favourably with the figures established by other workers.

2. Of the total pregnancies in the two groups of women there is a much higher percentage of abortions, miscarriages and fetal deaths among the Rh-negative women than in the Rh-positive group, 21% as compared with 13%. But:

3. The percentages of Rh-negative and Rh-positive women having no obstetrical mishaps are approximately equal.

4. In those women having one or more mishaps the percentage of complications in the total pregnancies is higher in the Rh-negative group (50% as compared with 35%).

5. There is no difference in the incidence of toxæmia in Rh-negative and Rh-positive women in the present series.

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Deliberate much before you say and do anything; for it will not be in your power to recall what is said and done.—*Epictetus*.

RHEUMATOID ARTHRITIS*

By Dean Robinson, M.D. —

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THERE were over 12,500 hospital days for rheumatoid arthritis in our service in Banff in 1942. Some of the patients were admitted twice or more. According to Comroe, the disease "is more common than the total number of cases of tuberculosis, diabetes, cancer and heart disease combined". The etiology of rheumatoid arthritis is unknown. The causes may be many. Comroe says,

"It is probable some as yet unidentified microbe plays a rôle in its etiology. Many other factors may contribute, or prepare the soil for such infection: these include heredity, poor environment, trauma (whether accidental, occupational, recreational, etc.), dietary or vitamin deficiency, associated diseases, psychic shock, worry, etc. This is purely theoretical as there is no definite proof that any bacteria cause this disease."

Steinbrocker defines rheumatoid arthritis as

"A systemic disease of undetermined origin, characterized by inflammation of articular and periarticular tissues which may lead to deformity and ankylosis. The cause of these changes has not been definitely established, although impressive evidence of the infectious nature of the disease has been advanced. The condition has sometimes been called 'atrophic arthritis' because of the atrophy of muscles so frequently seen in severe or advanced cases. It has also been termed 'arthritis deformans', owing to the characteristic deformities developing in the terminal stages. Often however, rheumatoid disease is arrested before these later stages appear in any marked degree."

In taking a history of a rheumatoid case, one usually discovers that the patient was never in her life very robust, while having no special complaint. She will tell you that the first sign she noticed was when one or more joints in her hand or foot or elsewhere became swollen and tender. If in the hand, the offending joint was usually one of the proximal interphalangeal joints and the swelling was fusiform in shape. This is the usual history though really any joint may be the first one affected. The swelling and

soreness stay for a while and then gradually go away, leaving maybe a thickening about the joint along with some stiffness. The next attack may affect multiple joints, fingers, wrist, ankles, feet: then knees, elbows, shoulders, hips and even the spine may be involved. Any or all of these joints may be affected at one time. The patient wakes up one morning with a real attack of arthritis which may simulate acute rheumatic fever. All of these attacks seemed to be separate entities but in reality the disease process was continuous since the involvement of the first joint.

Now we have a well established disease and as it progresses we find more definite signs and symptoms. The patient becomes mentally and physically ill. There develops a sort of transparency of the skin, moist, cold, clammy palms and soles, or sometimes hot, moist palms, numbness of the hands and feet, general weakness, atrophy of the extensor muscles and of the intrinsic muscles of the hands, subluxation of the joints of the fingers with ulnar deviation



Plate I.

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and limitation of the movements. It is not only in the small joints one notices these changes. The shoulders, hips, knees and spine may be affected. During the acute exacerbation, all the sore joints may be kept flexed for comfort and it is then that the extensors atrophy and the joints in time may become more or less fixed in these new positions. The position of the joints should be changed often and splinted in the best position if necessary to prevent deformity. Weight-bearing should never be allowed on joints during an exacerbation. Patients should be kept in bed. Rhythmic exercises should not be allowed at this time nor should the patient be allowed to knit or crochet. It is dangerous advice to give a patient with sore joints to keep going on them as long as she can, "so that the joints will not get stiff".

In the terminal type there is ankylosis of some joints in good or bad position, (depending on what sort of care and treatment the patient has had) with marked muscle atrophy. The patient is more or less resigned to her fate and lies in bed or is carried for a change to a chair. She is often not able to do anything for herself as her wrists and hands may be ankylosed and deformed, with ulnar deviation and subluxation of the fingers. The skin of the extremities becomes glossy and smooth, the thenar and hypothenar eminences reddened and there is atrophy of the intrinsic muscles of the hands and feet. Later on there is so much atrophy of the muscles of the arms and legs that even if the joints have retained some mobility, the muscles are not strong enough to move them and they lie constantly in the easiest position until they become ankylosed. Reference to treatment will be made later.

Differential diagnosis from osteoarthritis.—Most rheumatoid cases are sick looking and worried. When once the disease has been diagnosed it worries them to think of the future when they come in contact with many advanced cases. Osteoarthritic cases generally are healthy and robust looking. They are not particularly worried but they have pain which they think of as "rheumatics". They believe if their one or two sore joints are attended to they will be all right again.

Rheumatoid cases are more susceptible to windy weather and osteoarthritis cases dread cold, damp, changeable weather. Osteoporosis is noted early in rheumatoid films and there is

absence of other bone damage. The disease commences in the peripheral soft tissues and works inward. In osteoarthritis the disease commences in the centre of the joint and works outward. X-ray changes are seen early when nature tries to preserve the surface area of the joint by widening the joint at the edges with bony growth. Decalcification is only noted in osteoarthritis after a long period of non-use due to pain. Small joints are usually affected first in rheumatoid, though any joint may be affected. Knees and hips are commonly involved.

In osteoarthritis weight-bearing joints are generally attacked, namely, hips, knees, spine and shoulders. Heberden's nodes are commonly seen on the terminal phalangeal joints though these are not weight-bearing joints.

In rheumatoid, the proximal interphalangeal joints are most commonly affected. In osteoarthritis the terminal joints of the fingers are attacked. Rheumatoid deforms and cripples early: osteoarthritis late. The erythrocytic sedimentation rate is usually high in rheumatoid arthritis and normal or slightly increased in osteoarthritis. During a resting period in rheumatoid the rate may be much lower than during an exacerbation. Rheumatoid advances by a series of exacerbations and recessions, progressing further with each exacerbation.

At times it is almost impossible to distinguish between an acute exacerbation of rheumatoid arthritis and an attack of acute rheumatic fever. Certainly in taking a history of a rheumatoid case one cannot be sure whether a previous attack was acute rheumatic fever or an acute stage of rheumatoid arthritis.

True rheumatoid cases will usually tell you that they were never very robust but were fairly well until this disease started. Osteoarthritic cases will tell you they were never ill a day in their lives until this struck them.

Climacteric cases also have usually been very healthy until the arthritis started. They resemble rheumatoid cases otherwise and respond to the same treatment in about the same way.

TREATMENT

All cases on arrival at this clinic and after diagnosis, are started on mixed staphylococcus and polyvalent streptococcus vaccine (Crowe). The most satisfactory dosage is arrived at after several doses have been given and the response or reaction noted. A relatively large dose is

given at first and then each time if there is reaction the dose is reduced until maximum response is secured.

Rest.—This is probably the most important basic therapy in rheumatoid arthritis. Weight-bearing should not be countenanced on inflamed joints. Many patients arrive here physically and mentally ill. They are weak and hectic, and act and feel as though they had an elevated temperature. Usually there is no rise in temperature when judged by the thermometer but there is a rapid sedimentation rate. Hands and feet are cold and clammy, skin transparent, extremities smooth and glossy and there is numbness (pins and needles) in feet and hands. There is atrophy of muscles and probably flexion deformities of legs and arms. Joints are sore and muscles are kept tense to prevent movement of the joint, which causes pain. Splinting of joints allows the muscles to relax and thus lessens the inflammation. Rest in bed does the same thing for the weight-bearing joints. Inflamed joints are very similar to hot bearings in machinery. Bearings are lined with babbit which is the counterpart of the cartilage in the joint. When the bearing becomes hot the babbit liquefies and runs out and the bearing knocks and is destroyed. When the joint becomes hot the cartilage does almost the same thing and may disappear from the joint in a short time. The problem in both cases is how to prevent the damage to the bearing or joint, and how to prevent the lining from liquefying and "running out". The motto is, "Don't run a bearing when it is hot and don't exercise or bear weight on a hot joint".

If splints are used they should be removed daily for movements of the joints which may be accomplished by gently lifting the limb from the cast or splint and moving it through-out its course. It is then replaced in the splint until the next day. These movements are not done until the patient has been under treatment for a time and the joint pain is subsiding.

Diet.—Patients are fed on a nutritious diet supplemented by a multiple vitamin capsule. If there are signs of specific vitamin deficiency that particular vitamin in concentration is added to the list. Nicotinic acid and cevitamic acid are two that are frequently added, especially during gold therapy. Iron is required in most cases and is given in full doses. We eliminate sweets, condiments and fried foods

from the diet. Otherwise almost anything is allowed within reason. If a patient is underfed we try to build her up. If overfed we try to reduce her weight.

Infections.—It is our custom to wait for the removal of foci of infection until the disease has quieted down under regular treatment: suspected foci should always be attended to at that time. The disease should be as nearly quiescent as possible.

Physiotherapy.—At the Banff Springs Hospital there is a hot mineral pool kept at the temperature of about 101° F. As patients improve and are allowed on their feet, they may go to the pool in place of the mineral bath tub. They do this daily. It is found that the heavier water supports the body, relaxes the muscles and makes movements, including walking, much easier. Thus, the baths apart from any medicinal value they may possess, are very useful for allowing increased movements without pain. Patients comment on the increased movement without pain they get in the pool.

Psychological therapy.—This brings us to an important angle of treatment. Most arthritic patients are not the very depressed individuals some would have us think. True, they do have spells of depression (as do other people) but we have found them to be on the whole optimistic and happy to a surprising degree. It is most important that we who look after them do our best to keep them happy. If, on admission, we can impress them that we are interested in them and that we are going to do our best to help them get well again, they are very grateful. Hope revives when they find someone willing to give them a helping hand. The fortitude of these patients is amazing to me. At the Banff Mineral Springs Hospital there is a bright young sister who goes about among the patients spreading cheer and happiness. This helps to keep the patients interested and satisfied during their long stay in hospital. Once a month or so there is a "bingo" game for the patients. Those who are well enough to play come to the game walking or on crutches or on a wheel chair. At Xmas and Easter a Banff choir brings its special music for the benefit of the patients. Also there is the odd showing of movies or stills of the Rockies.

The rôle of these things in the building of morale cannot be overestimated. Patients hear of Banff from former patients who have been benefited here and also through their doctors

who have information on the treatment at Banff. It is a place where rheumatism sufferers came long before there was any special medical attention here. They leave all home responsibilities behind them and we try to bolster their determination to get well. They are told that there is no short cut to health: that their disease in most instances is one of long standing: that there may be a great deal of irreparable damage done. They are told that when the disease becomes quiescent, the joints in which the cartilage has gone may be covered with a tough connective tissue which may act in place of the cartilage and give them some use of the joint again. We explain to the early case that she may get entirely well; to the later case that she may be free of pain and have more freedom of movement and be able to carry on again in comfort; to the advanced case that she may be freed of pain and might even get the use of her legs again, though the cartilages will not return and the use will be limited. We make no promises but tell them that we will help them and that they must co-operate with us fully. Between us we will see how much improvement we can get.

Gold.—All cases on arrival at Banff are given a thorough physical examination, also full blood count and the erythrocytic sedimentation rate is done along with x-ray and urinalysis. The erythrocytic sedimentation rate is repeated every three weeks and the urinalysis every week prior to the gold injection. If possible every case with an increased sedimentation rate is started on myochrysine. The first dose is ten milligrams, the second fifty milligrams and the third and all succeeding doses one hundred milligrams, given at weekly intervals until a maximum of one and one-half grams have been given. After this the patient is given a month or six weeks at home to attain the full benefit of the series.

Gold is present in the system in quantities until a month or more after a series is given. It is stated that traces may be found in the urine six months afterwards. One series of myochrysine injections is often not enough to complete treatment and it is wise even in early cases to have two series. Certainly if the sedimentation rate is still up after the first series, two series or more are absolutely essential. This brings up the economic problem. It will be well to remember first, that gold treatment should be given with the patient at rest in an

institution and in bed most of the time. Urine tests have to be made weekly and sedimentation rates monthly. Second, gold is given over long periods of time. The average case should in the first series get one and one-half grams and this requires four months. Many cases here are not able, because of the cost, to stay for one complete series when in reality they need several series to get the maximum benefit. The cost of hospitalization is prohibitive for the average person, the lowest rate requiring \$150 per month and many people cannot afford that amount over an extended period.

Under these circumstances no list of statistics will give a true idea of the value of myochrysine. Most of the early cases get entirely well after regular treatment supplemented with chrysotherapy. This does not mean that they just get a temporary recession between exacerbations of the disease. It means that they become free from all signs and symptoms and the sedimentation rate becomes normal. One series may be enough to do this in some cases, though in most cases and certainly in later cases, more than one series is needed. If there are no complications and the urine is normal the doses are given regularly each week at one hundred milligrams after the first two weeks. Contraindications are nausea, dermatitis, diarrhoea, stomatitis or swelling and irritation of the face. It is impossible in most cases to anticipate toxic reactions. They may appear after only one or two doses or may appear for the first time after the patient has gone home following an extended treatment. The commonest forms of toxic reactions are dermatitis and stomatitis. Some form of skin irritation is very common during the course of injections. Only the odd case develops into a true dermatitis which may become very serious.

One case of serious dermatitis exfoliativa came on shortly after receiving one hundred and sixty milligrams of gold. She became ill and developed a high temperature which remained for days. Her face was swollen and eyes inflamed and almost closed. Lips were swollen and sore and mouth was affected throughout. All the mucous membranes and skin on her body seemed to be thickened and inflamed. The skin was covered with scales which shed over everything. She was most depressed. Calamine liniment was used generously and she was given large doses of nicotinic and cevitamic acid. She recovered after three weeks. Of course her gold injections were stopped as soon as she began to show signs of general dermatitis.

We have had six cases of dermatitis exfoliativa with no serious end results.

This serious case of exfoliativa developing after three doses of gold shows that the amount

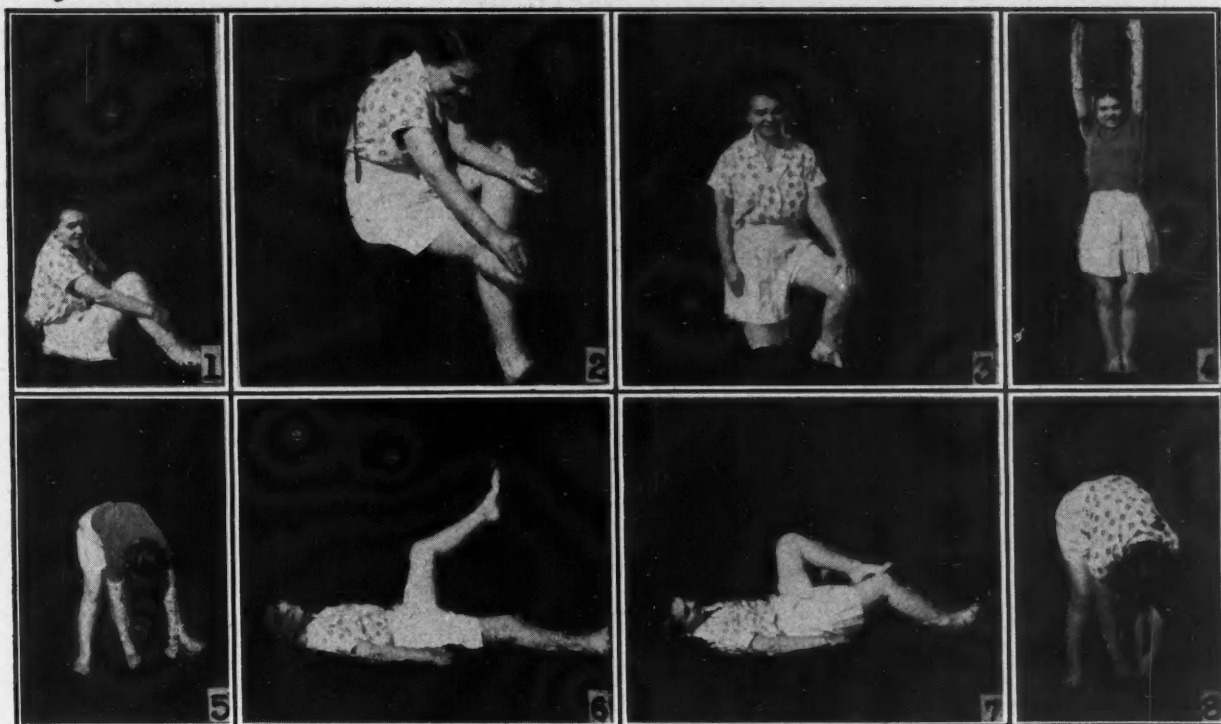


Plate II.—September 20, 1940. (1) Jack-knifing. From July 23, 1933 to November 6, 1937 (breaking down of adhesions) could not touch knees. (2) Right fingers on left foot but not both hands. Could not cross ankles before. (3) Full weight on one knee. Movement in hips. (4) Knees locked, shoulders free. (5) Twenty-three inches between heels. (6) Separate hip movement and muscle control. (7) Hip and knee freedom. (8) Reaching down to feet.

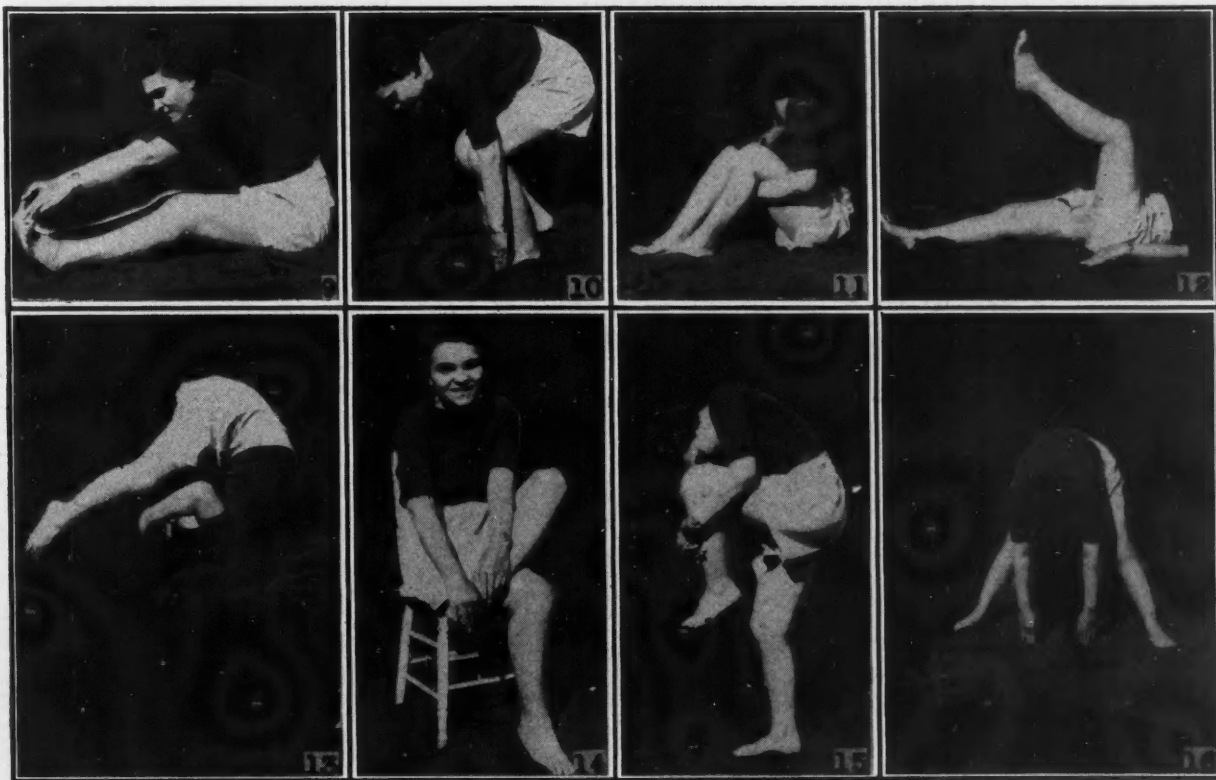


Plate III.—April 16, 1941. (9) A good stretch. (10) Balance and muscle control. (11) Jack-knifing, marked improvement in 7 months. (12) Separate hip movement and muscle control. (13) Strength of muscles, specially abdominal and nape. (14) Both hands on foot, greater knee and hip action. (15) Balancing on one leg. Muscle co-ordination. (16) Thirty-four inches between heels. Eleven inches in seven months.

of gold given is not in direct relationship to the severity of the reaction. Gold is apparently toxic to some people just as is arsenic or sulfanilamide. The patient above mentioned left here and went home. Several months later she died from a cerebral hæmorrhage. Sending the history sheet down to the doctor who did the post-mortem examination, we enquired as to whether there might have been some connection between the death and the previous attack of exfoliativa. The doctor stated that he did not think the hæmorrhage had anything to do with the dermatitis as she had completely recovered from that. This is the only case in our history in which there seemed to be any question of a serious ending to a case of exfoliativa.

Chrysotherapy has improved our treatment of rheumatoid arthritis more than any other single remedy. Nevertheless our treatment would fall far short if gold were the only form of therapy used. All cases are not suitable for gold. For instance some have major kidney trouble or a history of serious skin eruption. Some are terribly anæmic and have to be built up before they can take gold. After the first dose of ten milligrams there may be a toxic reaction and it may have to be stopped. This reaction may be pain in the stomach, nausea, headache or may be vomiting and diarrhoea. These cases are limited to general treatment including vaccine. It is stated in many quarters that chrysotherapy should not be exhibited in cases of pregnancy. I have yet to find any logical reason for this. Of course there is an extra load on the kidneys during pregnancy but if the same precautions were taken as in all cases I do not see why one should not carry on. As a matter of fact I have given it in pregnancy for fairly long periods, not knowing the patient was pregnant, without any untoward result. However, one would like to hear of other experiences regarding this.

Manipulation.—When joints are already deformed one has to wait until the disease is more or less quiescent, or under control, before using methods to improve the deformities. Where there is no ankylosis, movement may be increased by moving the joint through its full possible course and slightly increasing this possible movement daily. If this fails then it may be manipulated under general anæsthesia. It is always wise to do too little rather than too much while manipulating a joint. After mani-

pulating the joint and increasing the movement a cast or half cast should be applied to hold the leg in the improved position. This manipulation may have to be repeated several times to get the greatest amount of movement and the best position. After manipulations new casts are required each time. Casts are left on for forty-eight hours and then removed for easy exercise and replaced daily. If the joints are already ankylosed then it must be decided by the surgeon what action if any should be taken to correct them.

We wish to report a case of rheumatoid arthritis in a woman in her thirties. On coming here she brought an x-ray report which read as follows: "Osteoarthritis of both hip joints, right worse than left. Would judge there is complete destruction of articular cartilages with fixation of both joints."

This case demonstrates how easily one may mistake rheumatoid arthritis for osteoarthritis if one is judging by the x-ray film alone. Physician and x-ray expert must work together. Clinically this was a case of rheumatoid arthritis. Fingers of both hands were subluxated, with fixed joints of hand and wrist. Hands and feet were cold and clammy. Knees extended fully would flex 40 degrees: adductors of the thighs were contracted and drew the legs close together so that the heels could be separated only eight and a half inches. Both hips moved together: that is if one thigh were raised up the whole body along with the other thigh came up with it and there was only the slightest movement at the hips. She had not been able to touch her knees with her hands for seven years. If she were stood on her feet she could walk a little but could not sit down at all. She could not cross her ankles.

We present two sets of pictures taken in 1940 and 1941 to show the amount of improvement gained since she started treatment here in 1937.

Her treatment in 1937 started with general treatment fortified with Crowe's vaccine. This included hot mineral baths, rest, movements, etc. In 1939 gold was added to the armament.

As her condition became more or less quiescent, joints were loosened up under anæsthesia and a number of manipulations done. To hold what we had gained by manipulation her legs were put up with a sling under the knee and one under the ankle and foot. Pulleys were arranged so that when she drew up her knee,

her hip would flex and her foot would drop down, causing flexion of the knee. This gave the same action as riding a bicycle upside down. In this way, without weight on the joints she was able to exercise slowly and easily as everything was balanced. Later on she made the same movements in the hot mineral pool and later still on a bicycle in the physiotherapy department. She developed a great deal of movement in this way and still gave the joints a chance to heal. In 1940 according to the pictures she was able to separate her feet 28 inches and in 1941 30 inches had been gained.

SERIES OF CASES

We now submit a report on two hundred cases of rheumatoid arthritis treated with chrysotherapy at the Banff Mineral Springs Hospital during the past several years. All the cases were typical rheumatoid or atypical cases which were diagnosed as rheumatoid arthritis, along with several cases of spondylitis ankylopoietica and other cases of mixed arthritis-rheumatoid and osteoarthritis combined.

Early cases of rheumatoid arthritis often become free of symptoms and signs after one series of gold therapy. Others need two or more courses. Some cases with fixed joints arrived here with very little pain and apparently quiescent. However on taking the erythrocytic sedimentation rate it was found that the disease was still active. Gold helped them. If the disease has run its course and is burnt out, gold therapy would not be indicated.

Early cases are those with fusiform swelling of one or more proximal interphalangeal joints. They are able to work and carry on and have very little disability. While under treatment in hospital they were mostly in bed.

Medium cases are those in whom the disease is well established, with several or many joints involved and painful: may have contractures. They are able to work at times and get around with or without crutches. They stay in bed while under treatment.

Late cases are crippled and helpless. They are in bed most of the time. They may be carried to a chair but can do very little for themselves. They remain in bed while under treatment.

In 1939 16 cases received gold therapy averaging 500 mgm.

In 1940 23 cases received gold therapy averaging 1,210 mgm.

In 1941 46 cases received gold therapy averaging up to 2,940 mgm.

In 1942 71 cases received gold therapy averaging 1,000 to 1,500 mgm.

In 1943 44 cases received up to May gold therapy averaging 1,000 to 1,500 mgm.

Of the cases reported approximately 25% are considered cured. In this 25% are patients from all three stages of arthritis. Cured in this sense means free of pain and discomfort for those in the advanced class: freedom from pain and freedom of movement of joints in the medium class and ability to resume a more or less normal life. In the early class it means freedom from all signs and symptoms. In all classes it means a normal sedimentation rate and no further progress of the disease at this time. Many in the late class are able to walk again after many years. Most in this series have required two or more series.

Approximately another 25% were greatly improved, and if they could have had other series of gold they would be very likely in the cured class. They also come from the three classes of patients. They are not entirely free from pain and the progress of the disease is not entirely arrested. The economic factor enters here.

Approximately another 25% of all cases reported show some improvement but have gone away before the condition was satisfactory. Some of these have suffered for years and came here prepared to stay a month and hoped that they would then be well, whereas they should probably have been here off and on for several years.

Twenty-five per cent were not helped for various reasons. Wrong diagnosis in some, lack of co-operation, limitation of gold therapy because of other disease or toxic reactions may all have had something to do with the result. However, we do think that some cases of rheumatoid arthritis are not helped no matter what therapy is used.

Many cases of apparent rheumatoid arthritis are climacteric or arthritis commencing at the climacteric. They might be true rheumatoid and then again probably some of those which do not respond to gold therapy might be helped by gland therapy. The true rheumatoid cases seem to respond to gold therapy better than any of the doubtful ones. We use gold in all cases having a high sedimentation rate. Twenty-three of all the cases reported have had two or more series of gold. This appears to be a small percentage, but hospitalization is ex-

pensive and it is very difficult for most people to find the money for return visits of several months. This is where the government should step in. Arthritis and rheumatic diseases are so prevalent and yet there is no legislation passed to help in the diagnosis and treatment of these cases.

SUMMARY

1. Most cases of early rheumatoid arthritis, under one year's duration can be arrested and apparently cured by proper treatment.
2. In later cases, both moderate and severe, the disease may in many instances be brought to rest: further pain and crippling was stopped and some improvement in deformity noted.
3. Rheumatoid hips are sometimes mistaken for osteoarthritic hips, especially when the diagnosis is made by x-ray film alone.
4. Gold is a useful addition to our equipment for fighting rheumatoid arthritis. Good judgment must be used in its employment because of its toxicity.
5. Gold should be given only while the patient is in bed, preferably in an institution where she can be kept under daily, regular supervision.
6. The outlook for chronic arthritis cases is brighter than for almost any other chronic disease.
7. Legislation should be brought in to assist in the hospitalization of these cases. Rheumatoid arthritis is probably the greatest disabling condition with which we have to contend.

How rapidly flies will multiply when conditions are favourable is shown in a report by Dr. J. A. Charles, medical officer of health, Newcastle-upon-Tyne. Following an air raid on a railway goods yard, water used to extinguish the fire made a compost of flour, sugar, and fat which became widely dispersed in the nooks, crannies, and crevices of the buildings and provided an excellent breeding place for flies. "Within 14 days of the fire the whole of the centre of Newcastle was invaded by hordes of *musca domestica*, which were found at distances of as much as half a mile from the central breeding ground. In some houses the plague was so great and the importunity of the insects so persistent that to drink a cup of tea under reasonably hygienic conditions it was necessary to use a straw under cover, or a saucer as an umbrella."—*J. Roy. Inst. Pub. Health & Hyg.*, November, 1943, 7.

HEREDITARY ACHOLURIC JAUNDICE IN THE RAT

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THERE appears to be no record of hereditary jaundice among animals other than man, except in a new mutant strain of albino rats in which jaundice is evident at birth or shortly afterwards and persists throughout the life of the animal (Gunn³). This mutation was observed for the first time in the breeding stock of the rat colony of the Connaught Laboratories in 1934. Three young of a litter of thirteen rats, whose parents were apparently normal albino rats, were found to have a definite yellow tinge. The proportion of the litter affected, together with the normal appearance of the parents, suggested the possibility of this being a recessive mutation from two hybrid parents. This stock of rats is of Wistar origin among which Dr. Helen King has no record of such a mutation (King and Castle⁴).

The chief causes of yellow coloration of mammalian skin are those grouped under blood pigments, bile pigments, carotene, melanin, and lipids.

The yellow pigmentation in mutant rats was found to be inherited as a recessive character similar to carotinæmia in rabbits, and as the body fat of both mutant forms was found to be yellow in colour, specific tests were carried out to differentiate the two mutations. Tests for carotinoid pigment in the rats were entirely negative (Palmer⁵), while the van den Bergh test, which is specific for bilirubin, was found to be consistently positive.

Jaundiced rat serum is golden yellow in colour in contrast with the pale, straw-coloured blood serum of normal rats. Differential tests were carried out to determine whether the jaundice was obstructive, toxic, or hæmolytic in origin.

MANIFESTATIONS OF ACHOLURIC JAUNDICE

1. *Absence of bile in the rat urine* (Table I).—Urine was collected from jaundiced and normal adult male rats which were maintained under identical conditions with respect to housing and diet. Tests for the presence of bile were negative in both control and jaundiced animals. Similarly, the urine of hybrid rats,

presenting a normal appearance, was found to be free of bile.

2. *Bile in the rat blood plasma* (Table II).—Van den Bergh tests performed on blood plasma of the jaundiced rats consistently gave a negative direct immediate test and a positive indirect reaction, as seen in Table II.

TABLE I.
TESTS FOR BILE AND UROBILIN IN RAT URINE

No. Rats	Pheno-type	Geno-type	Age (mos.)	Sex	Av. Bili-rubin (blood)	Tests	Bile	Uro-bilin
13	Jaun-diced	ww	3-9	♂	9.8	11	—	Trace
13	Normal	WW	6-12	♂	0	13	—	Trace
3	Normal	Ww	4	♂	0	3	—	Trace

A few samples of blood plasma gave a positive delayed direct reaction which, as in the indirect van den Bergh test, is suggestive of a hæmolytic type of icterus. Blood plasma of normal rats gave a negative van den Bergh reaction. The amount of bile in the blood of individual jaundiced rats varied from 5.0 to 12.5 van den Bergh units, with an average of 9.8 units for the group

of 20 animals. Obstructive jaundice experimentally induced in two normal rats and in one rat with hereditary jaundice gave immediate direct van den Bergh reactions. Hybrid rats, like the homozygous normal animals, gave completely negative tests for bilirubinæmia. The amount of bile in the blood of the jaundiced rats is probably dependent upon the rate of hæmolysis as against the efficiency of excretion by the liver and kidneys.

3. *Erythrocyte fragility* (Table III).—Table III shows that the fragility of 24 normal animals varied between 0.40 and 0.55, expressed in percentage sodium choride solution. In 6% of the mutant rats there was a decreased fragility while the remaining 52% were within the range found in the control animals. Similarly, 5 of the 11 hybrid animals tested, although they were not jaundiced, showed a marked increased fragility of their erythrocytes.

The hybrid rats, like human carriers of familial acholuric jaundice, may show some abnormalities of the blood picture. The blood smear from one such rat (Fig. 1) shows a definite microcytosis. Anæmia and microcytosis

TABLE II.
VAN DEN BERGH TESTS ON RAT PLASMA

Rat No.	Phenotype	Genotype	Sex	Direct		Indirect test	Units of bilirubin	Age
				Immediate	Delayed			
17	Jaundiced	ww	♂	—	+	+	10.8	3 months
25	"	"	♂	—	—	+	8.0	9 months
48	"	"	♂	—	—	+	11.4	45 days
50	"	"	♀	—	—	+	10.4	45 days
57	"	"	♀	—	—	+	5.0	44 days
74	"	"	♀	—	+	+	12.5	6 months
No. tested								
20	Jaundiced	ww	♀ and ♂	—	±	+	Av. 9.8	All ages
13	Normals	WW	♀ and ♂	—	—	—	0	All ages
5	Normals	Ww	♀ and ♂	—	—	—	0	All ages
2	Normals	WW	♀ and ♂	+				Adults
1	(Exp. obs.) Jaundiced	ww	?	+				
	(Exp. obs.)							

TABLE III.
FRAGILITY OF RAT ERYTHROCYTES TO NaCl SOLUTION

No. tested	% of animals tested	Phenotype	% NaCl Solution										
			0.3	0.35	0.4	0.45	0.5	0.55	0.6	0.65	0.7	0.75	0.8
24	100	Normal (WW)	h	h	hn	hn	hn	hn	n	n	n	n	n
34	41.1	Jaundiced (ww)	h	h	h	h	h	h	hn	hn	hn	hn	hn
	52.9	"	h	h	hn	hn	hn	hn	n	n	n	n	n
	6.0	"	hn	hn	n	n	n	n	n	n	n	n	n
11	45.0	Normal (Ww)	h	h	h	h	h	h	hn	hn	hn	hn	hn
	55.0	"	h	h	hn	hn	hn	hn	n	n	n	n	n

Key: h—hæmolysis; n—negative hæmolysis; hn—beginning of hæmolysis.

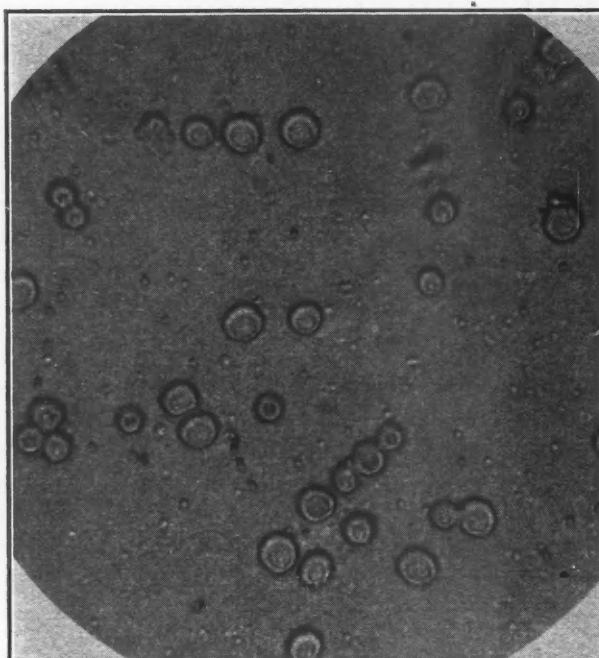


Fig. 1.—Photomicrograph of a blood smear of a hybrid rat showing microcytosis.

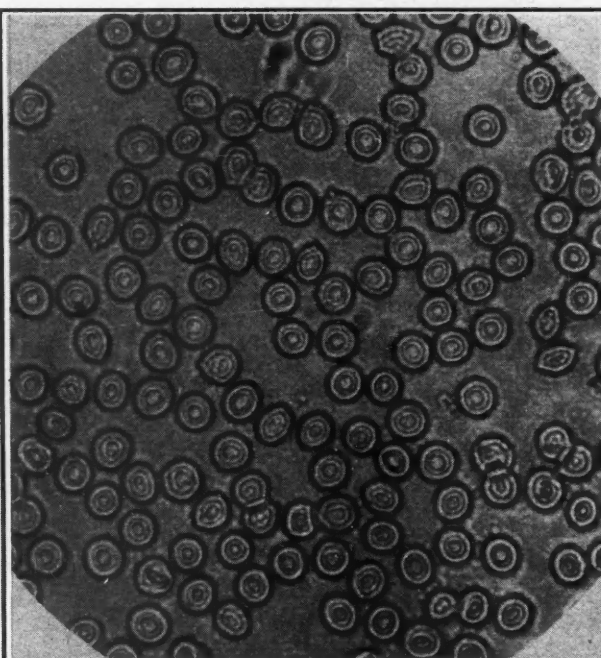


Fig. 2.—Photomicrograph of a blood smear of a normal rat.

were not frequent findings in the blood picture of adult jaundiced or hybrid rats. When the abnormal blood smear from the hybrid rat is compared with that of a homozygous normal animal (Fig. 2), the uniformity in size of the normal erythrocytes (coefficient of variability of 2.6%) is significantly greater than in the case of the affected rat (coefficient of variability, 14.9%). The Price-Jones frequency curves (Fig. 3), using diameter measurements of 500 erythrocytes from blood of normal and hybrid

rats, show the relative distribution of the blood cells of different sizes. The average erythrocyte diameter of the normal rat was 6.2 ± 0.0289 microns, while that of the abnormal animal was 5.0 ± 0.257 microns.

4. *Blood cell counts.*—A study of the blood-cell counts shows certain interesting results, especially in groups of young rats of the same age, sex, and of known genetic constitutions (Table IV). The average erythrocyte count of the normal group was 4.4 million cells, of the

TABLE IV.
RAT BLOOD CELL COUNTS AND HEMOGLOBIN ESTIMATION

No. Rats	Sex	Phenotype	Grams weight	Age	Red blood cells*	White blood cells	Hæmo-globin	Index	% Retic.
5	♂	Normal (WW)	150	44 days	4,140,000	13,528	85	1.0	3.5
	♂	" "	136	" "	4,690,000	9,432	82	0.9	4.5
	♂	" "	158	" "	3,420,000	11,832	79	1.1	3.0
	♂	" "	156	" "	5,370,000	9,800	86	0.8	2.5
	♂	" "	138	" "	4,280,000	14,132	84	1.0	3.5
5	♂	Jaundiced (ww)	114	" "	4,870,000	13,532	85	0.9	7.0
	♂	" "	141	" "	4,510,000	13,666	81	0.9	18.0
	♂	" "	104	" "	4,100,000	12,666	75	0.9	9.0
	♂	" "	132	45 "	2,840,000	13,200	91	1.6	7.5
	♂	" "	...	" "	3,240,000	12,400	86	1.2	11.0
5	♂	Normal (Ww)	154	" "	3,910,000	10,900	94	1.2	9.5
	♂	" "	136	" "	4,280,000	16,432	93	1.1	11.3
	♂	" "	150	44 "	4,090,000	12,966	77	0.9	11.5
	♂	" "	152	" "	3,750,000	12,332	62	0.8	16.0
	♂	" "	142	" "	4,070,000	12,220	92	1.1	6.5
23	♀ and ♂	Normal (WW)	...	Adult	7,170,000	13,920	98	0.7	1.2
14	♀ and ♂	Jaundiced (ww)	...	"	7,900,000	12,126	87	0.5	1.7
5	♂	Normal (Ww)	...	"	8,940,000	....	100	0.5	0.65

*Heart blood was used in all estimations.

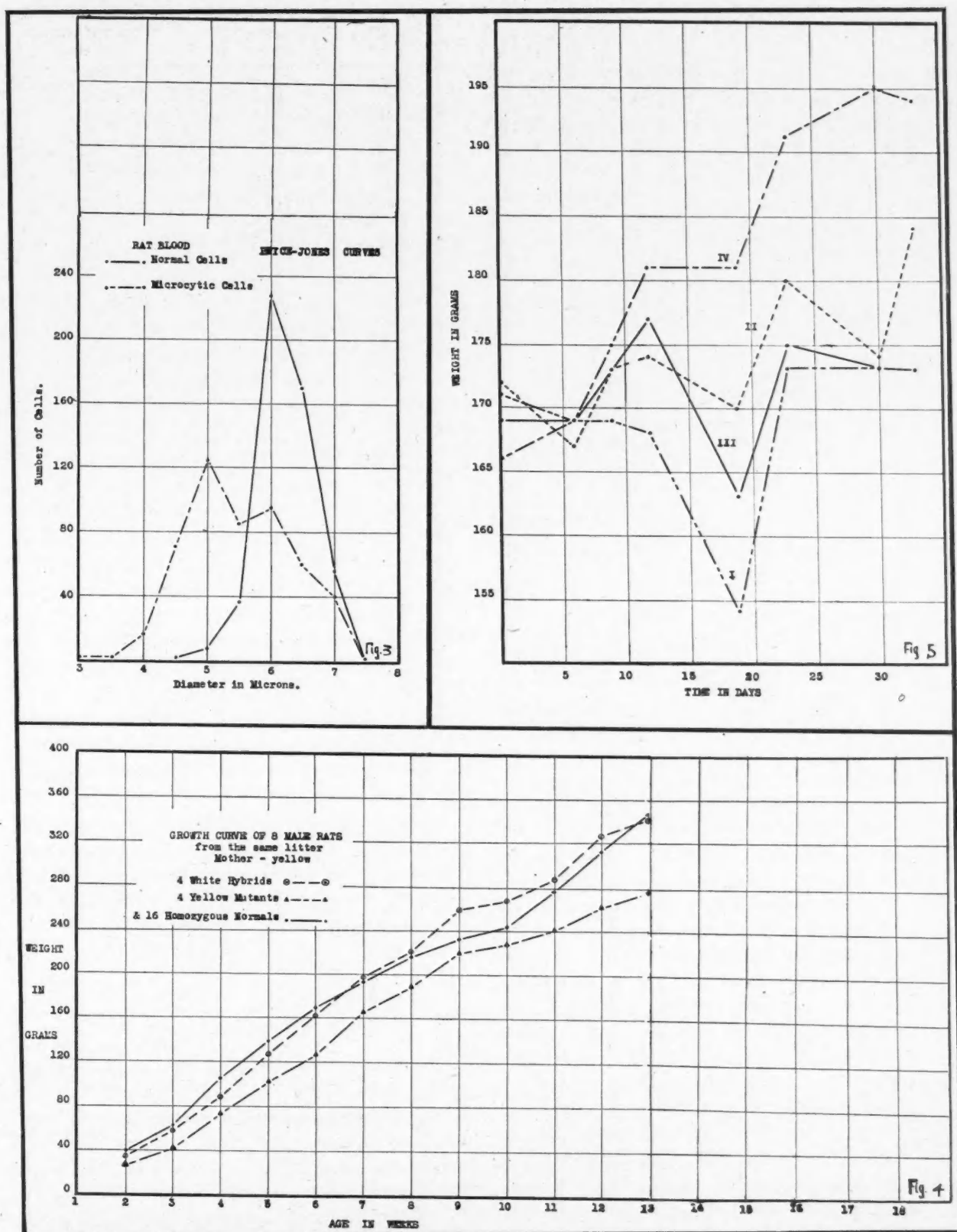


Fig. 3.—Price-Jones curves of normal and microcytic rat erythrocytes. Fig. 4.—Growth curves of normal and jaundiced rats. Fig. 5.—Carotene as a source of vitamin A in jaundiced and normal rats. Of the jaundiced rats, group I received the basal diet, group II the basal diet plus cod-liver oil and group III the basal diet plus carotene and viosterol. Normal rats (Group IV) received the basal diet plus carotene and viosterol.

jaundiced rats 3.9 and that of the hybrid group 4 million.

Examination of the reticulocyte counts, on the other hand, shows that the average percentage in normal animals is considerably lower than that of the jaundiced and hybrid groups of rats. The average red-cell count of adult hybrid rats slightly exceeds the average count of both normal and jaundiced groups. Coexistent with the high erythrocyte count there is a lower reticulocyte count in the jaundiced group, which probably indicates a more quiescent state of the bone marrow. No significant difference was observed in the white cell counts of the different groups of animals.

In the animals with the higher hæmoglobin indices (1.2 and 1.6) some anæmia appears to be present.

5. *Colour of the fæces.*—The fæces of jaundiced rats were found to be as deeply pigmented as those of normal control animals. There was no evidence of clay-coloured fæces such as occur in obstructive jaundice from faulty absorption of fats. However, the colour of the fæces is not always an accurate indication of the amount of urobilin excreted. In some, but not in all, tests, the amount of urobilin was increased in the excreta of the jaundiced rat over that of normals. Here, probably, as in other symptoms of this disease when remission takes place, the amount of urobilin excreted may also approach that found in normal rats.

6. *Malnutrition of jaundiced rats.*—When the jaundiced rats were being reared it was noticed that they had a slower growth rate than normal litter mates of the same sex suckled by the same dam (Fig. 4). Eight young male animals were selected from a mixed litter of thirteen rats of which the dam was jaundiced and the sire was of normal hybrid constitution. A similar series of weights was recorded for young of the female sex, of which one of the hybrid controls had to be taken from a different litter. In both examples the jaundiced pups showed a definite lag in growth rate (Table V). As a control of possible heterosis in the hybrid male growth curve (Fig. 4), a corresponding curve for 16 homozygous normal males was included. Litters of rats upon which weight tests were carried out were all maintained under similar environmental conditions and fed the same rations in comparable amounts.

Some of the jaundiced rats were very much underweight and resembled animals on a de-

TABLE V.

Age days	4 normal hybrids; average weight in gm.	4 jaundiced recessives; average weight in gm.
Birth	6.0	5.5
7	12.0	11.5
10	15.0	13.0
14	22.0	19.0
21	40.0	33.3
28	61.5	51.75
35	88.0	78.5
42	111.75	101.75
49	116.75	112.5
56	133.5	127.5
63	152.25	145.75
70	163.5	150.0
77	176.5	155.5
84	186.5	154.0
91	193.75	171.5
98	203.0	176.5
105	207.0	181.5
112	212.0	186.0

The above weights were obtained from a mixed litter of rats from a cross of a hybrid male with a jaundiced female, of which there were 4 jaundiced and 3 hybrid females in the litter. One hybrid rat of the same age and sex was added to the litter to make up the eight animals. Weighings were made at weekly intervals.

ficient diet. This suggested the idea of determining their ability to utilize carotene as a source of vitamin A, for Greaves and Schmidt² have shown that jaundiced rats may not be able to convert carotene into vitamin A. The above investigators used rats in which experimental obstructive jaundice had been induced, but they eliminated the possibility of faulty absorption by injecting the carotene subcutaneously, intravenously, and intraperitoneally, as well as giving it orally.

An experiment employing paired feeding was carried out in which 15 jaundiced rats of the same sex and weight were divided into three groups of five. One group was given a Sherman vitamin A deficient diet of:

Casein	18%
Yeast	8%
Starch	65%
Salt mixture	4% (Cowgill)
Vegetable oil	5% (corn oil)

The second group was given the same diet and cod-liver oil as the source of vitamin A. The third group was given the basal diet plus carotene, and viosterol was added to supply approximately the same amount of vitamin D as group II received. To make sure that the diet received by group III was adequate, five normal rats (group IV) of the same weight and sex were fed this diet along with the five jaundiced rats.

The results of the experiment as judged by the average weight changes for the different

groups (Fig. 5) suggest that the normal rats did relatively well on the carotene diet, while the jaundiced animals grew poorly and at the termination of the experiment were in a condition comparable to that of the rats in the group not receiving any vitamin A in the diet; however, these rats did not develop carotinæmia. Those which received cod-liver oil, although not so heavy as normal rats, appeared to be in relatively good condition. This was in contrast with the animals of groups I and III which not only lost weight but showed marked nervous symptoms.* The method of paired feeding used in the experiment ensured that each group of rats consumed the same quantity of food.

7. *Nervous phenomena of jaundiced rats.*—While the stock of jaundiced rats was being reared on a diet of "Purina Chow", in which the main source of vitamin A is in the form of carotene, some of the rats developed marked nervous symptoms. This condition was noted particularly in animals which were very much underweight. The affected animals appear to have a weakness of the posterior extremities which gives them a wobbly gait. A marked lateral eversion of the hind feet is a characteristic feature in the walking movements of the jaundiced rats. A more detailed comparison of these two male rats, which are from the same litter, is given in Table VI.

These nervous symptoms of the jaundiced rats are remarkably similar to those found in normal rats which have been reared on a vitamin A

deficient diet (Aberle¹). Prolonged feeding of a diet deficient in vitamin A has been shown to give rise to a condition of weakness and paralysis of the hind limbs in normal rats which is accompanied by a characteristic lateral eversion of the hind feet when walking.

Examination of sections of spinal cord and of peripheral nerves from three jaundiced animals in which the nervous symptoms were particularly evident, revealed no gross lesions which might account for the symptoms. The microtechnical procedure consisted of formalin fixation, followed by Weil's method for staining myelin sheaths, Scharlach R, hæmatoxylin and eosin, and Marchi's method.

8. *Hereditary nature of rat jaundice.*—The data from rat-breeding experiments show that the jaundiced condition is inherited as a non-sex-linked recessive character (Gunn³).

9. *Polyuria.*—The mutant jaundiced rats showed a marked polyuria. The volume of urine excreted was ten times that of normal control rats in some cases. The results of tests for sugar and ketones were similar to those found in urine of normal rats. Two jaundiced rats were given repeated subcutaneous injections of 0.5 c.c. of posterior pituitary extract in an attempt to stop the polyuria. Negative results were obtained.

The data of Table VII show that there is a real difference in the liver fat (per 100 grams of weight) between the sexes, but not between normal and jaundiced animals.

TABLE VI.

	Normal rat	Nervous rat (jaundiced)
Age.....	21 day.....	21 days
Sex.....	Male.....	Male
Genotype.....	Hybrid.....	Recessive (homozygous)
Jaundice.....	Negative....	Positive
Erythrocyte count...	4.2 million...	3.8 million
Red blood cell fragility.....	0.45 (normal)	0.75 (increased)
Reticulocytes.....	9.6 %.....	39.1% (count of 500 red blood cells)
Hæmoglobin.....	69.....	73
Hæmoglobin index...	0.8.....	0.95
Sections of cord and brain.....	Normal.....	Normal (Marchi and Weigert-Pal)
Sections of spleen....	Normal.....	Congested with red blood cells
Sections of liver.....	Normal.....	Normal (Cinnamon-coloured liver)
Section of kidney....	Normal.....	Normal (Cinnamon-coloured kidney)

TABLE VII.

LIVER FAT

Sex	Mgm. % Liver fat	
	Normal	Jaundiced
Female.....	3.71	4.04
Male.....	6.54 7.29	6.79 6.12

Blood-urea estimations were made upon 6 normal and 6 jaundiced animals of the same sex. The results are expressed in milligrams per 100 c.c. of blood as in Table VIII. Tests were carried out upon 4 normal and 4 jaundiced animals while upon a diet of Purina Chow, and also on animals which had been fasted 24 hours. The data show a marked difference between the blood urea estimations in animals which were fed and those which were deprived of food for 24 hours previous to the tests, but there is no

TABLE VIII.

Rat number	Blood urea	
	Normal	Jaundiced
	mgm. %	mgm. %
1	23.8*	29.2
2	25.4	22.0
3	22.0	24.5
4	24.0*	28.0*
5	15.5†	13.5†
6	13.5†	12.5

*Estimations made on rats on Purina Chow diet.

†Estimations made on rats fasted 24 hours.

significant difference between the quantities of blood urea of jaundiced and normal animals.

Attempted therapeutic measures on jaundiced rats.—Splenectomies were performed on 10 jaundiced rats of about 3 months of age. All survived the operation and were still jaundiced at the end of 6 weeks. The rat condition differs in this respect from human acholuric jaundice. The results of the above experiment suggested the possibility that adequate reticulo-endothelial tissue had not been removed by splenectomy in the case of the rats. Liver lobectomies, therefore, were performed upon 3 jaundiced animals of 200 grams weight which had previously undergone splenectomy. Portions of liver weighing 1.6, 1.4 and 1 gram were removed from three rats of which the average total liver weight was 10 grams. Examination of these animals 30 days later showed that the jaundiced condition was still present. Definitely enlarged spleens were found in approximately 20% of the young jaundiced rats which were examined at autopsy and others in which splenectomies were performed. However, examination of biological sections of 7 spleens taken from jaundiced animals showed no qualitative differences from those of normal animals, except that they were engorged with erythrocytes and the reticulo-endothelial cells were filled with breakdown products of blood.

DISCUSSION

The findings on jaundiced rats can be separated into those which are persistent throughout the life of these animals, and others which are more or less transitory, or more apparent at certain ages than at others.

The more constant findings in the affected rats are: a definite non sex-linked recessive inheritance of the jaundiced condition; an absence of bile in the urine; a persistent bilirubinæmia throughout the life of these animals; a con-

sistently negative immediate direct van den Bergh reaction, and a lag in growth rate.

In 20 litters, comprising 135 rats, resulting from crosses of normal with jaundiced parents, none of the offspring was affected, whereas 86 jaundiced and no normal young were produced from matings in which both parents were mutants. Of 249 jaundiced rats reared none reverted to the normal state. The bilirubinæmia persisted throughout the life of these animals.

Blood plasma of jaundiced rats consistently gave indirect or delayed van den Bergh tests. However, direct immediate tests were obtained by ligating the bile ducts in normal and jaundiced animals.

A definite lag in growth rate was a characteristic finding in the mutant rats. This was evident in both sexes and occurred in young with the jaundiced constitution, whether they were reared by jaundiced or by normal mothers.

Tests for bilirubin and urobilin in the urine of mutant rats gave results similar to those of normal animals. A marked polyuria of unknown etiology was present, however, in the jaundiced rats.

Among the inconstant signs in the mutant rats were: increased fragility of the erythrocytes, microcytosis, reticulocytosis, anæmia, splenomegaly and nervous symptoms.

The abnormal findings in the blood of the jaundiced rats were seen only in young growing animals of 3 to 8 weeks of age. Many of the mutant rats died during this period, but others which survived to the adult state appeared to be healthy, except for a persistent bilirubinæmia. Such adults were usually fertile and raised young.

Definite splenic enlargement was observed in some young mutant rats. Histological sections, however, showed no qualitative differences from those of normal animals, but many erythrocytes were present and the reticulo-endothelial cells were filled with yellow pigment. Splenectomies did not alleviate the jaundiced condition of the mutant rats, thus apparently differentiating this disease from familial acholuric jaundice in man.

Muscular tremors and a wobbly gait were observed in some of the jaundiced rats. These symptoms could be detected in young rats of 3 weeks of age and they usually persisted throughout the life of such animals. However, it was found that the above nervous symptoms could be induced in jaundiced rats by feeding a diet

deficient in vitamin A or one in which carotene was the source of this accessory factor.

The chain of symptoms described in this work may vary widely, and the different symptoms may appear to have no relationship to each other. Nevertheless, by breeding experiments, the fundamental origin of the abnormal constitution of the affected animals can be shown to have its starting point in but one pair of defective hereditary carriers or genes. These were derived from the germ plasm of the original mutant rat.

SUMMARY

1. A new mutant jaundiced rat has been found among the rats of the breeding colony in the Connaught Laboratories.

2. The mutant rats regularly show bilirubinæmia (indirect van den Bergh reaction), jaundice, acholuria, polyuria and subnormal growth rate. They occasionally show changed erythrocyte fragility, microcytosis, reticulocytosis, and nervous symptoms.

3. Splenectomy does not alleviate the jaundiced condition of the mutant rats.

The author wishes to thank the Connaught Laboratories for the plentiful supply of experimental animals, among whose animal colonies the new mutant strain of rats was found, and also for the opportunity to carry out this work in that institution.

He is also greatly indebted to Dr. J. W. MacArthur, under whose supervision the work for the degree of Doctor of Philosophy was done in the field of genetics of which this paper is a part, and to Dr. N. Ford for a moving picture film of the rats.

Appreciation is also expressed to Dr. E. W. McHenry, and especially to Dr. C. H. Best of the Connaught Laboratories, for valuable suggestions on the physiological aspects of the problem and for the many facilities placed at the disposal of the writer.

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"Increased employment and incomes for large sections of the population have resulted in consumption of more of the protective foods by many persons who previously could not afford these foods. One effect of this has been to create shortages, notably of meat and butter. This experience has demonstrated for all time that the supposed surpluses of foods in the years before the war were not surpluses at all, but relative deficits that were masked by inequality of distribution."—Russel M. Wilder, *New Eng. J. Med.*, 1943, 229: 496.

ANTISYPHILITIC THERAPY WITH CLORARSEN WITH EVALUATION OF TOLERANCE*

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THE mechanism by which the arsphenamines destroy spirochaetes has been the subject of considerable controversy. Ehrlich believed that these drugs were directly spirochaeticidal, a view which has been modified by later authors, whose investigations have demonstrated that the arsphenamines must first be converted to a partially oxidized product before a spirochaeticidal action is noted. Since Eagle's investigations,¹ in which he tested the spirochaeticidal action of arsphenamine under anaerobic conditions and found it negligible when dissolved in an atmosphere of nitrogen, this latter view has been generally accepted. Therefore, it seems rational to use such an oxidized product as an antisyphilitic drug.

The term arsenoxide, not scientifically correct, is used in clinical literature to designate a particular oxidation product of the arsphenamines (meta-amino parahydroxyphenylarsine oxide). This compound was first investigated by Ehrlich and Hata,² and then, after careful clinical and laboratory research, by Tatum and Cooper,³ it was introduced for general use under the trade name of mapharsen. It is now generally recognized and is probably the most widely used of all the arsenicals. The advantages of such a drug may be listed as follows: (1) it is a pure and stable chemical substance; (2) it can be chemically standardized without complicated procedures; (3) it requires no special precautions in storage, in preparation or administration. Solutions may be prepared in advance, may be kept without changes for hours and may be injected rapidly. On the other hand, the neoarsphenamines are unstable colloids and different lots may vary considerably in therapeutic effect and toxicity. Both effect and toxicity can only be measured by biological methods, as chemical standardization is impractical and deterioration may occur in the ampoule or in solution without being noticeable. These drugs must not be older than six months, must be kept cool and in a dark place, and in-

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jected immediately after preparation. Disregard for any of these and slight technical error will enhance the incidence of untoward reactions.

The dosage of arsenoxides is much smaller than that for the arsphenamines, therefore less arsenic is handled by the body; this and aforementioned features result in a markedly lower toxicity in practical use.

The following table, using data of the Co-operative Clinical Group and the U.S.A. Navy, is a combination of figures given by Moore⁴ and Goodman and Gilman.⁵

of this drug would be the same as mapharsen.

The toxicity and spirochaetocidal action, tested in animal experiments by Tompsett and co-workers⁶ and Guy and co-workers⁷ substantiated this assumption. The therapeutic index was 28, and both toxicity and spirochaetocidal action in animals did not differ from the values determined with mapharsen. Preliminary clinical reports by the above mentioned authors^{6, 7} and by Long,⁸ Kampmeier and Henning⁹ shows the same trend. Disappearance of the spirochaetes from primary lesions and involution of pri-

TABLE I.
INCIDENCE OF REACTIONS WITH ROUTINE THERAPY

Arsenical	Death	Overall reactions	Dermatitis per 1,000	Hepatitis per 1,000	Minor reactions per 100	Nitritoid crises per 100
606.....	1:42,000	1:989	0.9	1.16	40.0	0.1 - 0.5
Neosarsphenamine...	1:28,000	1:1,335	0.81	1.20	25.0	0.1 - 0.5
Mapharsen.....	1:3,000,000	1:7,036	0.053	0	20.0	None

Neosarsphenamine was abandoned for use in massive arsenotherapy as hæmorrhagic encephalitis occurred in 4 to 5%, and death in 1% of patients given this form of treatment. With mapharsen the figures were 1.0 and 0.25%, respectively.

The therapeutic efficiency of arsenoxide is indisputably high and, on the debit side, only one disadvantage may be listed and that is, the rapid excretion in three days of this form of arsenical. Therefore, it is necessary to administer such drugs twice a week in all cases of early syphilis in order to ensure a uniform high level of anti-syphilitic drug and the maximum therapeutic effect. The arsphenamines are excreted in five to six days, and are usually given once a week.

A new preparation, dichlorophenarsine hydrochloride, which belongs to the arsenoxide group, has recently been introduced and after preliminary toxicological studies has been used in clinical experiments. This drug (3 amino-4 hydroxyphenyl dichlorarsine hydrochloride) is similar in structure to mapharsen, is marketed under the trade name of clorarsen and phenarsine hydrochloride. It contains 25.8% of arsenic, while mapharsen contains 29% of trivalent arsenical. It is put up in ampoules of 0.045 and 0.067 gm., yielding 0.0308 and 0.047 gm., of arsenoxide; this is the exact equivalent of the active principles yielded by 0.04 and 0.06 gm. of mapharsen. It was therefore to be expected that the toxicity and therapeutic effect

primary and secondary manifestations occurred promptly.

Serological reversal occurred 100% in primary syphilis, and in 90% in secondary syphilis in the series studied by Kampmeier⁹ during the first year. This latter figure is not impressive, but it is comparable with the results achieved with mapharsen when the same treatment scheme was used. Both Kampmeier and Henning⁹ and Long⁸ gave higher dosage during the first two weeks only, and then proceeded with injections of 0.067 gm., once a week, a scheme, which in the light of newer reports, cannot be considered as optimal for early syphilis. Guy *et al.*⁷ gave only 0.045 gm., once a week to women and 0.067 gm., to men, in short courses of six weeks, alternating with equally short courses of bismuth subsalicylate, a scheme which may rightly be termed as inadequate in early syphilis. No severe reactions, such as post-arsenical dermatitis, hepatitis, blood dyscrasia, or encephalitis have so far been reported. An incidence of 11 to 15% of minor reactions such as gastrointestinal upset, headache, malaise, nausea and diarrhoea was observed by afore-mentioned investigators. This figure compares favourably with an estimate of 20% of such reactions with mapharsen.⁴

Summarizing previous reports on the basis of preliminary evidence, it was noted that both the toxicity and therapeutic effect in animal and clinical experiments, in serological response, and

incidence of untoward reactions after clorarsen, did not differ from the results obtained with mapharsen.

It is well known that a conclusive clinical evaluation of the toxicity of antisyphilitic drugs can only be achieved by registering reactions in a large number of unselected patients. As the incidence of serious reactions with arsenoxide is very low, valid figures may be obtained only by careful observation over a period of many years.

In over 400 cases minor reactions only, such as gastrointestinal upsets, malaise, vomiting, pain, and diarrhoea after mapharsen have been observed during the past two years in the treatment centre at the Royal Victoria Hospital. These upsets play an important rôle in the irregular attendance of patients at clinic; therefore, we thought it might be of interest to compare the tolerance to clorarsen of patients who reacted to mapharsen. Fifty such cases were given a trial with both neoarsphenamine and clorarsen. With mapharsen the dosage was 0.06 gm., with neoarsphenamine 0.6 gm. and with clorarsen 0.067 gm. In early syphilis the arsenical was given twice a week for ten weeks with overlapping and alternating courses of bismuth (six injections); arsenical was then repeated, bismuth again overlapped, and the scheme continued in manner advocated by Moore.⁴ In late syphilis, arsenical was given once a week only. Severity of reactions was classified as follows: (0) no reaction; (0.5) slight transitory malaise which did not interfere with work; (1) malaise and gastric discomfort of short duration, which interfered with work temporarily; (2) vomiting, cramps and diarrhoea, interfering with work temporarily; (3) prolonged pain, vomiting, diarrhoea, and incapacitating discomfort over a period of days.

The results are summarized as follows: 13 patients tolerated both neoarsphenamine and clorarsen well; 13 patients tolerated only clorarsen; 7 patients tolerated only neoarsphenamine; 17 patients gave reactions to all three drugs; they were carefully questioned and the following results were obtained: 8 tolerated clorarsen better than neoarsphenamine or mapharsen; 3 took neoarsphenamine best; 3 had equally severe reactions to neoarsphenamine and clorarsen, but less severe than with mapharsen, and 3 patients had equally severe reactions to all three drugs. In only one instance was a reaction after clorarsen more severe than with

TABLE II.
TOLERANCE TO NEOARSPHENAMINE AND CLORARSEN OF
FIFTY PATIENTS WITH REACTIONS AFTER
INJECTION OF MAPHARSEN

Case No.	Severity of reaction		
	Mapharsen	Neoarsphenamine	Clorarsen
1	3	0	1
2	3	3	1
3	3	0	0
4	3	3	1
5	2	0	3
6	2	2	2
7	2	3	1
8	2	3	0
9	2	½	½
10	2	1	0
11	2	0	0
12	2	2	0
13	2	0	1
14	2	1	1
15	2	1	2
16	2	0	0
17	2	2	1
18	2	1	0
19	2	2	½
20	2	½	2
21	2	0	0
22	2	2	1
23	2	0	1
24	2	0	2
25	2	0	0
26	2	0	0
27	2	2	1
28	2	0	0
29	2	2	2
30	2	2	1
31	2	0	0
32	2	1	2
33	2	3*	0
34	2	0	1
35	2	3	0
36	1	2	0
37	1	0	0
38	1	3*	0
39	1	0	0
40	1	2	0
41	1	2	0
42	1	½	½
43	1	1	0
44	1	0	1
45	1	1	1
46	1	2	0
47	1	2	0
48	1	0	0
49	1	0†	0
50	1	0	0

*Nitritoid crises.

†Case 49, had severe nitritoid crises following the administration of neoarsphenamine 0.6 gm. after completion of these investigations.

mapharsen; this patient was one of the three who tolerated neoarsphenamine better than the mapharsen.

The above figures show that change of drug was of benefit in 47 of the 50 cases.

The following table gives the comparison of severity of reactions to mapharsen, clorarsen and neoarsphenamine; it shows that neoarsphenamine was followed by a significantly higher

incidence of reactions, which were more severe than those observed after clorarsen. These patients, as do all others receiving clorarsen, stated that a cool sensation was felt in mouth, tongue and lips, but that it did not have the accompanying, objectionable smell or taste that was experienced after injections of neoarsphenamine, and, to a lesser degree, with mapharsen.

TABLE III.

COMPARISON OF SEVERITY OF REACTIONS TO ARSENICALS

Degree of Reaction	Mapharsen No. of cases	Clorarsen No. of cases	Neoarsphenamine No. of cases
3	4	1	7
2	31	6	13
1	15	14	7
1/2	0	3	3
0	0	26	20

These figures are used to illustrate the comparative severity of reactions after clorarsen and neoarsphenamine in patients who reacted to mapharsen. No attempt to compare the toxicity of the two arsenoxides is made. If patients with reactions to clorarsen were selected, it is expected that change of drug would also prove beneficial. The practical importance of having an alternative drug at one's disposal, clorarsen in this instance, is demonstrated in the following case reports in brief.

Case 1, listed in Table I as No. 11 had an early latent syphilis. Therapy with mapharsen was given in 1939, but severe gastrointestinal upsets with prolonged vomiting and diarrhoea made further treatment impossible. Neoarsphenamine produced the same results, so treatment was limited to bismuth subsalicylate. After two years of treatment seronegativity was achieved; this was followed by sero-relapse. Treatment was instituted with clorarsen at this time; no vomiting occurred and slight malaise was no contraindication for further therapy. Cases 4 and 8 in Table I, had early syphilis with secondary manifestations; neither neoarsphenamine nor mapharsen was

TABLE IV.

MINOR TOXIC REACTIONS IN TEN PATIENTS RECEIVING FIVE DAY TREATMENT WITH CLORARSEN

	1st day	2nd day	3rd day	4th day	5th day
Nausea					
Vomiting..	9	1	1	2	1
Fever.....	4	2	0	1	1
Headache...	2	1	0	0	0
Toxic erythema...	0	1	0	0	0

tolerated. Case 8 had no reaction to clorarsen, and only slight disturbance was observed in case 4. Therapy was brought to satisfactory conclusion in both instances. Serological reversal in these, as well as in all other cases of early syphilis in this series, was achieved within a year, and the spinal fluid did not show any pathological changes.

Ten patients with early syphilis, in the primary or secondary stage, were given 1,340 mgm. of clorarsen by intravenous infusion over a five-day period. The minor upsets, only, as shown in Table IV were observed.

The number of patients in this series is too small to draw any conclusions, but on the whole, the results evoked a favourable impression.

SUMMARY

Tolerance to clorarsen and neoarsphenamine was tested in 50 cases with gastrointestinal upset and other minor reactions after injection of mapharsen. Change of drug was beneficial in 47 cases; in 26 instances clorarsen was tolerated without reactions; in 11 reactions occurred, but were less severe than with mapharsen. In only one case was reaction more severe than with the other drugs. Although neoarsphenamine was tolerated well by 20 patients, it was found to be less suitable as an alternative drug, as reactions were more frequent and more severe.

Minor reactions only were observed and are listed in the ten cases given massive arsenotherapy with clorarsen.

The clorarsen used in these investigations was supplied by the courtesy of Messrs. E. R. Squibb and Sons.

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THE TOBACCO HABIT.—Sir Harold Scott (Braintree, Essex) writes: Referring to the question on page 502 of the issue of October 16 concerning a cure of the tobacco habit, may I suggest a remedy which I have found efficacious, first with myself and later in other cases of those who have wished to stop the smoking habit? It is to rinse the mouth with a solution of 0.25% silver nitrate. I believe that I originally got the idea from the *British Medical Journal*, but it must have been at least thirty years ago.—Cor. in *Brit. M. J.*, 1943, p. 632.

OESTROGENS FOR THE PREVENTION OF POST-PARTUM BREAST ENGORGEMENT

(A Comparative Study)

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OESTROGENS and testosterone have been reported to be valuable for the prevention of the breast engorgement which accompanies efforts to stop lactation. It has been demonstrated^{1 to 9} that if sufficient quantities of these hormones are given, lactation can be stopped soon after delivery without the discomfort which is so often observed when this procedure is necessary.

There has been some differences of opinion as to whether or not lactation is actually inhibited when oestrogens or testosterone are given. Such workers as Diddle, Nagyfy and Sells,¹ and Steart and Pratt,² believe it probable that in most women lactation is not inhibited by oestrogens. This point of view seems tenable, since Steart and Pratt demonstrated that, although lactation may be diminished in some cases, it will not cease if nursing is continued. Most of their patients continued to nurse their babies quite satisfactorily throughout treatment and after the medication was stopped. The work of Diddle and his co-workers is substantially in agreement with this observation.

It is evident, then, that in many patients lactation can be maintained in spite of large doses of oestrogens, provided the breasts continue to be stimulated by nursing. It is obvious, therefore, that oestrogens can be used to prevent breast engorgement in those instances where lactation is desirable, as well as in those where its inhibition is the object. Inhibition of lactation is apparently accomplished through withdrawal of the nursing stimulus, although the administration of oestrogens may help. It is important that the uncomfortable breast engorgement that accompanies the cessation of lactation can usually be adequately controlled by relatively large doses of oestrogens.

Such oestrogens as α -oestradiol, oestrone, and diethylstilboestrol have been used and these are effective if given in sufficient quantity. The only reported disadvantage is that involution of the uterus may sometimes be delayed. However,

if the treatment is not prolonged this disadvantage is apparently of little consequence, and in our experience has not been observed in any marked degree.

Abarbanel,¹⁰ Kurzrok and O'Connell,¹¹ Hellman and Leonard,¹² and others, have reported that testosterone will prevent breast engorgement. We have used it, but have found it to have no advantage over oestrogens, and we believe that one is better advised to use an oestrogen in female patients.

Because it may be given by mouth in effective dosage, diethylstilboestrol has become the oestrogen most commonly used. It rarely produces nausea or other side effects when given soon after delivery, so that rather large doses can be given without difficulty. Oestrone and α -oestradiol are also effective, but only when given by intra-muscular injection. Until recently there has been no other natural oestrogenic product sufficiently active when taken orally to accomplish equivalent results with reasonable dosage. The urine of pregnant mares contains several oestrogens, and a mixture of these in conjugated form has recently been made available. This product has been so effective in the oral treatment of menopausal symptoms that we decided to determine its value when the control of breast engorgement associated with inhibition of lactation was the criterion.

METHOD AND RESULTS

A group of 30 patients was taken in whom it was desirable to inhibit lactation for various reasons. The usual procedure was to give natural oestrogen in doses of three tablets (3.75 mgm.) by mouth, every four hours for five doses. These patients were compared with another group of 30 who were given diethylstilboestrol in doses of 5 mgm. twice daily for two days. Since in every instance it was desirable to stop lactation we made no effort to determine whether or not lactation would continue under the stimulus of nursing. Each patient was carefully observed and the response to treatment was charted. If painful breast engorgement did not accompany the cessation of lactation, treatment was considered satisfactory. In this way it has been possible to compare the effectiveness of the natural oestrogen and diethylstilboestrol on a milligram for milligram basis, when both are given by mouth.

It will be seen in Table I that in 25 of the 30 cases reported a total of 15 tablets (18.75

TABLE I.
CASES RECEIVING NATURAL OESTROGEN

Case	Post-partum day	Indication	Dosage		Result
			Tab-lets	Mgm.	
1	8th	Inverted nipples	15	18.75	Good
2	7th	Insufficient milk	15	18.75	Good
3	6th	Cracked nipples	15	18.75	Good
4	1st	Illegitimacy	15	18.75	Good
5	7th	Child refused to nurse	15	18.75	Good
6	1st	Stillbirth	15	18.75	Good
7	1st	Illegitimacy	24	30.00	Fair
8	19th	Milk insufficient	24	30.00	Fair
9	13th	Child refused to nurse	15	18.75	Good
10	2½ mos.	Weaning	24	30.00	Failure
11	1st	Stillbirth	15	18.75	Good
12	5th	Inverted nipples	18	22.5	Fair
13	1st, 3rd, 10th	Eczema of breasts	36	45.0	Fair
14	5th	Inverted nipples	15	18.75	Good
15	1st	Inverted nipples	15	18.75	Good
16	1st	Stillbirth	15	18.75	Good
17	2nd	Stillbirth	15	18.75	Good
18	4th	Severe anæmia	15	18.75	Good
19	2nd	Stillbirth	15	18.75	Good
20	2nd	Stillbirth	15	18.75	Good
21	3rd	Illegitimacy	15	18.75	Good
22	2nd	Stillbirth	15	18.75	Good
23	4th	Neonatal death	15	18.75	Good
24	3rd	Stillbirth	15	18.75	Good
25	4th	Stillbirth	15	18.75	Good
26	11th	Insufficient milk	15	18.75	Good
27	6th	Cracked nipples	15	18.75	Good
28	5th	Cracked nipples	15	18.75	Good
29	2nd	Patient refused to nurse baby	15	18.75	Good
30	9th	Insufficient milk	15	18.75	Good

mgm.) was sufficient to prevent breast engorgement associated with the total inhibition or suppression of lactation. In case 12, the dose required was 18 tablets. In three other cases (7, 8 and 13) there was a recurrence of lactation, which was controlled by repetition of the medication. Case 10 also received diethylstilbæstrol and testosterone which failed to bring about cessation of lactation. This observation is in conformity with that reported by other workers. The earlier post partum that oestrogens can be administered, the better the results are likely to be. In those instances where lactation has been going on for a period of months the administration of oestrogens is likely to fail. It will be noted in Table II that administration of 20 mgm. of diethylstilbæstrol was effective in all but four patients. In cases 6, 9, 11 and 28 the drug was repeated because of a moderate degree of recurrence of breast engorgement. This subsided quickly with a further dose of 10 mgm.

TABLE II.
CASES RECEIVING DIETHYLSTILBÆSTROL

Case	Post-partum day	Indication	Dosage		Result
			Cap-sules	Mgm.	
1	2nd	Rheumatic heart disease	4	20	Good
2	2nd	Inverted nipples	4	20	Good
3	2nd	Inverted nipples	4	20	Good
4	1st	Neonatal death	4	20	Good
5	8th	Cracked nipples	4	20	Good
6	7th	Cracked nipples	8	40	Poor. Repeated 9th, and 10th days
7	3rd	Premature 30 weeks	4	20	Good
8	3rd	Unable to nurse. Fractured baby's leg	4	20	Good
9	7th	Cracked nipples	6	30	Fair. Repeated 9th day
10	2nd	Inverted nipples	4	20	Good
11	2nd	Illegitimacy	5	30	Fair. Repeated 8th day
12	2nd	Premature	4	20	Good
13	2nd	Hydrocephalus	4	20	Good
14	2nd	Stillbirth	4	20	Good
15	1st	Stillbirth	4	20	Good
16	2nd	Stillbirth	4	20	Good
17	2nd	Hydrocephalus	4	20	Good
18	1st	Neonatal death	4	20	Good
19	1st	Chest disease	4	20	Good
20	1st	Coryza	4	20	Good
21	10th	Cracked nipples	4	20	Good
22	9th	Mastitis	4	20	Good
23	3rd	Stillbirth	4	20	Good
24	10th	Feeding difficulty	4	20	Good
25	7th	Refused to nurse	4	20	Good
26	1st	Stillbirth	4	20	Good
27	3rd	Poor nipples	4	20	Good
28	1st	Stillbirth	6	30	Fair. Repeated 7th day
29	1st	Stillbirth	4	20	Good
30	1st	Stillbirth	4	20	Good

DISCUSSION

It will be noted that the administration of natural oestrogen in the dose used was quite as effective as diethylstilbæstrol for the purpose for which it was given. The usual dose of natural oestrogen was 15 tablets, which is equivalent to 18.75 mgm., since each tablet contains 1.25 mgm. of the mixed conjugated oestrogens of pregnant mare's urine. The usual dose of diethylstilbæstrol required to produce equivalent results was 20 mgm. From this it would appear that 1.25 mgm. of natural oestrogen is at least equivalent to 1 mgm. of diethylstilbæstrol for the prevention of breast engorgement, although no effort was made to determine the minimal effective dose of either substance. Since diethylstilbæstrol is known to have marked

œstrogenic effectiveness when administered by mouth, this is an interesting observation. It demonstrates that natural œstrogens are comparably active when given by mouth. These observations are in keeping with those of Gray¹³ and Freed *et al.*,¹⁴ recently published. These workers reported that for the treatment of menopausal patients 1.25 mgm. natural œstrogen was equivalent to 1.0 mgm. of diethylstilbœstrol in the case of Gray, and at least 0.5 mgm. (probably more) in the case of Freed. Glass and Rosenblum¹⁵ and Sevringhaus and St. John¹⁶ have also demonstrated satisfactory response when natural œstrogen was given for the relief of menopausal symptoms. There would seem to be no doubt that the œstrogen used in this study is much more active when given by mouth than any other preparation from natural sources heretofore available.

CONCLUSIONS

1. Natural œstrogen by the oral route in doses of 3 tablets every 4 hours for 5 doses has proved effective for the prevention of breast engorgement during the post-partum inhibition of lactation.

2. According to this study it would appear that 1.25 mgm. of natural œstrogen is at least the equivalent of 1 mgm. of diethylstilbœstrol when inhibition of breast engorgement is used as a criterion of œstrogenic effectiveness.

3. Both natural œstrogen and diethylstilbœstrol proved quite efficient and both preparations were well tolerated in all cases.

4. Œstrogens or testosterone have not proved to be helpful if given two or more months after delivery. They are most effective when given in the early post-partum period.

We are indebted to Ayerst, McKenna and Harrison Ltd. for a supply of premarin, the natural œstrogen used in this investigation. It is a mixture of conjugated œstrogens, the principal one being œstrone sulphate. It also contains smaller quantities of other œstrogens, such as œstradiol equiline, equilenine and hippulin, probably as sulphates.

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Résumé

L'œstrogène naturel par voie buccale à la dose de 3 comprimés toutes les 4 heures, à raison de 5 doses a été trouvé efficace pour prévenir l'engorgement mammaire durant la phase d'inhibition de la lactation qui suit la délivrance.

1.25 mgm. d'œstrogène naturel équivaldrait à 1 mgm. de diethylstilbœstrol, d'après le critère d'empêchement de l'engorgement mammaire. Les œstrogènes, naturel et synthétique, sont également efficaces. Les œstrogènes et le testostérone doivent être administrés très tôt après la délivrance si l'on veut obtenir les meilleurs effets.

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THE NEW KNOWLEDGE OF TUBERCULOSIS*

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TUBERCULOSIS is not a spectacular disease, except, perhaps, in a few surgical cases. It is, both for patients and physicians, a slow, tiresome thing to treat, especially when diagnosis has been delayed. It may not be stimulating to physicians who are, after all, just human men. But we at the Sanatorium, who are in the thick of it and see the tragedy of it, so to speak, in concentration, even we are not without hope and encouragement. These, and also the desperate urgency of the matter, I wish to bring to you as well as I can.

For the hope, we shall first take a look backward and count our gains—looking back, not like Lot's wife, with any longing for the bad old days, but to learn, and to draw conclusions; to recognize former mistakes and failures and get a finger on the causes of these. Then we must set the goal at which we are definitely to aim, and keep our eyes and minds upon it. Especially must we understand, grasp and use faithfully all the methods known. Here is where the "new" knowledge comes in.

The national system of vital statistics was not established in Canada until 1921, when the Dominion Bureau reports the death rate from tuberculosis to be 87.6 per 100,000 of the population. Twenty-one years earlier, that is 1900, in Ontario and Quebec, the Provincial rates

* Address given at the Dalhousie University Refresher Course, Halifax, N.S., October 15, 1943.

were above 200 per 100,000, and, as these Provinces contained the greater part of the Dominion's population, we can accept these figures as the average Canadian death rate from tuberculosis at that time. It is relevant to note that in the Dominion in 1900 there were hardly any facilities for the diagnosis and treatment of tuberculosis, and, apart from a few tuberculosis dispensaries, there was only one small sanatorium for the care of consumptives in Ontario. By 1940 a network of diagnostic clinics had developed in every Province in Canada. Sanatorium beds have increased almost to 11,000, the capital outlay in building amounting to \$30,000,000 and an annual expenditure for upkeep of some \$8,000,000. The death rate from tuberculosis in 1941 had fallen to 50.6, a reduction of some 75% in forty years.

But some 6,000 persons still die each year in Canada from tuberculosis, and at least 30,000 new cases crop up annually to cost the country some \$8,000,000 yearly, this in spite of the fact that we have today facilities for diagnosis and treatment such as were unheard of twenty years ago. It must be either that these facilities are not properly used, or that they are still inadequate.

Tuberculosis among civilians during world wars I and II.—It is within the memory of many in this audience that there was an appalling increase in tuberculosis in Europe during and immediately following the first world war. Published reports show that the death rate from tuberculosis tripled within two or three years of the commencement of the war in a number of the mid-European countries. In England, the mortality from tuberculosis also had risen, especially among young women employed in war industries, and in 1918 it was 25% higher than in 1913. An even greater rise had taken place in Germany among young women engaged in heavy war industries, and in 1917, it was 75% higher than in 1913.

Public health studies have revealed that the causes of this terrific increase in tuberculosis were, malnutrition; crowded, unsanitary housing; exposure to infection; unaccustomed labour for long hours, both in the battle line and on the home front. The world is again facing war on a scale which has already led to conditions even worse than those in 1914 to 1918. In just the first two war years, 1939 to 1941, the tuberculosis death rate rose in England and Wales 12%; in Scotland 18%; in France and Germany,

while the precise rates are not available, it is known that there has been a marked increase in tuberculosis. In Canada,* there was a rise of 5% between 1940 and 1941. In the United States, there has been no increase and the rate for 1942, 43.6, is slightly lower than that in 1941. On this continent, we have been fortunate enough so far to escape the devastation that is sweeping over Europe, but even here there are strains and stresses that tend to lower the physical resistance.

Thus, while it is true that there has been a steady decline in our death rate from tuberculosis over several decades, we may yet suffer a serious set-back, and the gains of recent years may be lost unless we fully realize the danger early enough and put forth every effort to avoid it, turning all our war-time knowledge toward increasing the former gains. We must make good use of what was learned by mistakes in the former war, and of the accumulating experiences of the one still going on. The hardest physical test for our fighting men, and indeed for all of us, may be yet to come. What we can—and must—do about it, I shall come to in a few moments.

TUBERCULOSIS AMONG SERVICE MEN

It will be recalled that, during the last war, the physical findings of the chest, by percussion and auscultation, were rated of greater worth in diagnosis than the roentgenological examination of the lungs. We were later to find out the fallacy of this view. In a study of deaths among Canadian pensioners from that war, published by the Department of Pensions and National Health in 1939, we find that, of the 600,000 men who enlisted in the service, eventually 8,500 were pensioned for tuberculosis, and that 3,000 had died from this disease. In other words for every hundred men killed in action, six died from tuberculosis, and for each hundred pensioned for wounds, twenty-five were pensioned for tuberculosis. The cost of tuberculosis, to Canada, as a result of the last war has been computed at one hundred and fifty million dollars. In the United States, the total cost of the care of tuberculous veterans for the twenty years, 1921 to 1940, has been computed to be well over \$300,000,000.

* In the preliminary report recently issued by the Vital Statistics Branch of the Bureau of Statistics, Ottawa, 1942, there has been a slight reduction in the death rate from tuberculosis, from 53.1 to 51.5 per 100,000 of the population.

Many of these recruits undoubtedly had tuberculosis at the time of enlistment, but physical examination, alone, carefully as it was given, frequently failed to reveal latent as well as active lesions in the lungs. The lesson learned has been well taken to heart. At the beginning of the present war, the Department of Militia and Defence, following the advice of specialists in diseases of the chest, wisely decided that all recruits enlisting in the Canadian Army should have an x-ray examination of the lungs before they were admitted to the service. Those found with significant tuberculosis were to be rejected. The official report states that up to March, 1942, of the 400,000 men on whom x-ray films were taken, 3,969, or 1%, were rejected on account of past or present pulmonary tuberculosis.

It is further instructive to note in the same report that, among a group of men discovered with minimal tuberculosis, only 270 cases out of 1,334, that is, about one in five, could be diagnosed from the clinical findings alone, when the x-ray film clearly demonstrated significant tuberculosis in the lung. In the moderately advanced cases, only some 357 out of 759, that is, about one-half, could be diagnosed correctly from the clinical examination; in the far advanced group, 117 out of 136. Here it seems worth mentioning that, among all the troops in Canada and overseas, only 114 cases of clinical tuberculosis have developed between September, 1939, and March, 1942. This must be taken as evidence of the value of x-ray examination in the detection of early or latent tuberculosis in the lungs.

While we must by no means set aside the physical examination of the chest, for there are various non-tuberculous diseases in the lungs which cannot be clearly demonstrated from radiological findings alone, we may as well accept the fact, as far as tuberculosis is concerned, that the stethoscope is not to be compared in accuracy to a well-taken x-ray film in bringing to light early active, or silent quiescent lesions in the lungs, which may be the precursors of later disabling disease.

ADVANCES IN DIAGNOSIS

The technical side of radiology has been immensely improved since the time of the last war, and it has been conclusively demonstrated again and again in mass surveys as well as by the hundreds of thousands of examinations conducted on inductees into the army, that the

x-ray is the surest, in fact the only means to rule out the presence of tuberculosis in the lungs.

Now, we have a new advantage in what is called the miniature film. The standard celluloid film, 14 by 17 inches, has been employed in Canada by the Department of National Defence in the examination of the chests of some 500,000 men prior to admission to the army. On the other hand, in the United States, the War Department plans to examine practically all men by means of the photo-roentgenogram, a miniature 4 by 5 inch celluloid film, on account of its speed, exactness, economy and the fact that it will reduce storage space by over 65%. As many hundreds of thousands of x-ray examinations are still to be taken on Canadian service men both at admission as well as at discharge, the 4 x 5 inch photo-roentgenogram will be used more and more as a means of diagnosis as well as a graphic legal record in cases of future pension claims.

The cost of these miniature films is about one-tenth that of the standard size and their use for detection of early tuberculosis opens up new possibilities in public health work. There is little doubt from now on that it will be the accepted practice to have whole communities, sick and well, examined by means of the x-ray, for there is where prevention as well as cure has its first and greatest point of attack. This has been the dream of public health officials for years, and, now that a way has been opened up, the radiographic film will be a permanent record of the chest condition.

THE TUBERCULIN TEST

Our knowledge of the epidemiology of tuberculosis has been gained chiefly through the diagnostic use of tuberculin. The test is of undoubted value in public health, industrial, university and school surveys. Reactors to the tuberculin test are advised to have an x-ray examination of the chest. Non-reactors, with few exceptions, are considered to be free from tuberculosis. Research studies continue to be carried out in America to improve and standardize tuberculin and remove such elements as may cause a non-specific reaction. This new knowledge may become highly valuable, but it is possible that as time goes by the miniature x-ray film, on account of its low cost and universal employment, may make the need of tuberculin testing unnecessary in mass surveys.

SPUTUM EXAMINATIONS

Examination of the sputum is still of great importance in the diagnosis of tuberculosis. The presence of tubercle bacilli in the sputum undoubtedly points to pulmonary tuberculosis. In cases of suspected tuberculosis with a negative sputum it is well to examine the gastric contents for acid-fast bacilli. Sputum should not be considered negative from one examination alone; several specimens should be analyzed by the concentration method. If the reports are negative and tuberculosis is still suspected, request the Public Health laboratory to carry out the "culture" test on a specially prepared medium with further specimens. The test is almost equal in accuracy to guinea pig inoculation. Unfortunately, it requires several weeks for the results of the test to be determined.

BRONCHOSCOPY

Examination of the bronchial tree by means of the bronchoscope has become a common practice in many sanatoria and chest clinics throughout Canada. The examination by the bronchoscope is of undoubted value in determining the presence or absence of tuberculous tracheo-bronchial ulceration. Also, for the differential diagnosis of such conditions as bronchiectasis, unexplained hæmoptysis, malignant neoplasia, pulmonary abscess, bronchial stenosis. The use of the bronchoscope has been of great help, not only as an aid to diagnosis, but in planning treatment to follow, particularly in thoracoplasty. The procedure is a simple and safe one in the hands of an experienced bronchoscopist.

TREATMENT

There is as yet no specific cure for tuberculosis. Until one is found, we must continue with the accepted lines of treatment which have been found to be of benefit in the past, that is, rest, careful regulation of life, good food, fresh air, combined, in suitable cases, with one or other of the various collapse methods to enforce complete or partial rest of a diseased lung. Unfortunately, collapse therapy is available for but a comparatively small proportion of tuberculosis sufferers, as the majority of them, when first discovered, are already in an advanced stage of the disease. This is a matter of deep concern to us all and one which can be remedied if we will only profit from the lessons learned in world wars I and II. The new knowledge gained from service examinations, as well as from mass surveys among apparently healthy

people, shows that approximately 1% of the population have active or healed tuberculous lesions in the lungs. As I have said, many of these lesions are early and minimal in extent and can be brought to light only by means of the x-ray. The truth of this is beyond dispute. Patients with minimal tuberculosis respond readily to the customary sanatorium regimen, and the great majority of them may be completely restored to health when treatment is given at the right time and in the right way. The slogan used in diagnosis campaigns is most appropriate here—early discovery, early recovery.

As to patients who are found to be in a moderately to far advanced stage of tuberculosis, while the outlook for recovery is somewhat gloomy for many of them, much can yet be done in these days, to lengthen out life as well as to enable a considerable proportion of them to take up again some gainful occupation. We have at our disposal the various forms of collapse therapy, as well as a number of surgical procedures, so successfully employed in the leading sanatoria in America, artificial pneumothorax, combined with intrapleural pneumolysis when required, phrenic nerve paralysis, thoracoplasty and its various modifications. These as well as many other procedures are notable advances in comparatively recent years in the treatment of tuberculosis.

CHEMOTHERAPY

There is no chemical agent that has proved of real value in the treatment of tuberculosis. In recent years, the remarkable results obtained in other infections, notably pneumonia and streptococcus infections, from the use of sulfonamide compounds has again aroused the hopes of research workers that the cure of tuberculosis may lie along chemical paths. Recently, several investigators have called attention to one of the sulfa-derivatives "promin". Animal experiments, while encouraging, do not yet warrant the general use of this remedy among patients.

TUBERCULOSIS CONTROL

The eradication of tuberculosis, while still a serious public health problem, is by no means impossible of achievement. Unless the present war continues for some years to come, we have every reason to feel that, with the gains obtained in the past, and the goal in sight, it is not too much to hope that, during the next two decades, tuberculosis may be reduced to a comparatively

minor cause of death in Canada. This can be accomplished through a Dominion-wide scheme of health education and prevention, that is, case findings by means of public health clinics, periodic examination of people, including the common use of x-ray films, treatment facilities for open cases of tuberculosis, and this means free treatment for those who can ill afford the benefit of sanatorium care. The cost of the undertaking is not beyond our resources, and it is hoped, that, when the coming Federal Health Insurance Scheme is finalized it will embrace a comprehensive and effective plan for the prevention and control of tuberculosis in every province of the Dominion.

A new strictness, a new determination in preventive measures are afoot, aroused, perhaps, by this war and by the years of education, but more is needed, and must be kept going. The problem is a social and economic one, a challenge to all the people, but the medical profession must be prepared to lead and direct the movement and to provide the inspiration—"Say not the struggle naught availeth".

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VARICOSE VEINS IN THE SOLDIER*

By Major C. W. Clark, R.C.A.M.C.

VARICOSE veins, though not a severe disability, do impair a fighting man's efficiency and reduce his category. In spite of the fact that all men joining the Army have a medical examination, a surprisingly large number present themselves for treatment of varicosities in one or both legs. This may be due to the fact that varicosities were not noted at the time of enlistment, or that only slight varicosities were present, which enlarged under service conditions. Another factor is that men who had injection therapy prior to enlistment, with apparently good results, develop recurrences under arduous training.

INVESTIGATION

The investigation of a case with varicose veins is a relatively simple, but none the less important procedure, if the proper treatment is to be carried out. After ruling out any general con-

dition which would contraindicate treatment, the patient should be examined in a good light, stripped from the waist down. It is very important to remove the boots and socks because so often the symptoms in the legs are due to foot conditions. The patient is best examined standing on a low stretcher or platform. The varicosities can be made to stand out well if the weight is thrown largely on the leg to be examined. The veins are palpated to determine tension and extent, and a careful examination of the popliteal area may reveal an enlarged small saphenous vein. Small saphenous incompetence may be the cause of varicosities of the great saphenous below the knees through the anastomotic channels.

The following tests are useful in the examination:

1. *Cough test*.—With a hand on the larger varicosities, an impulse on coughing indicates valvular incompetence.

2. *Trendelenburg constriction test*.¹—With the patient lying down and the leg elevated to empty the veins, a rubber tube is applied in the upper thigh, tight enough to occlude the superficial but not the deep veins. If on standing the veins remain collapsed, the test is positive and no further test is necessary. On release of the tourniquet the varicosities will be seen or felt to fill from above downwards. A positive test indicates valvular incompetence at the sapheno-femoral junction.

If the varicosities fill rapidly below the constriction in five to fifteen seconds, the following test should be applied to determine where the incompetence between the superficial and deep venous circulation is situated.

3. *The three tourniquet test of Ochsner and Mahorner*.²—In this test three constricting rubber tubes are applied with the patient lying down and the leg elevated, one at the level of the tibial tubercle, one in the lower thigh, and one in the upper thigh. On standing, if the veins still fill rapidly, it indicates that the incompetent communicating vein is below this level. This is clinically rare and was not encountered in our cases, although anatomically there are more communicating veins below the knee. Removal of the lower tourniquet, with rapid filling of the varicosities indicates a small-saphenous incompetence. Removal of the second rubber tube resulting in rapid filling indicates an incompetent communicating vein in the thigh. Removal of the highest tourniquet is

* From the Surgical Division, No. 5, Canadian General Hospital.

the same as the Trendelenburg test. If a small-saphenous or communicating-vein incompetence has been demonstrated, and there is a further down rush of blood on removal of the top rubber tube, it is evident that there is an associated valvular incompetence at the sapheno-femoral junction.

4. *Patency of the deep circulation.*—Perthe's test³ is claimed by many authorities to establish this point. A rubber tube is applied about the upper thigh and the patient walks briskly several times across the room. If the varicosities collapse the deep veins are said to be patent. If the varicosities remain tense it is claimed that the deep veins are obstructed. This, however, is not true, because incompetence of the small saphenous or deep communicating veins will allow blood to flow from the deep to the superficial circulation and maintain the tension of the varicosities. If the Perthe's test is taken as conclusive evidence of deep venous obstruction many patients will be denied treatment of varicosities due to incompetent small-saphenous or communicating veins. As Homans⁴ has stated, absence of blueness in the dependent foot is sufficient proof that the deep veins are patent. Luke⁵ stresses that if varicose veins are present they probably were present before the deep phlebitis occurred. He feels that if varicosities are present the deep veins must be patent to carry back the reversed flow in the varicosities, and has treated two cases with improvement. In doubtful cases an elastic bandage may be applied from toes to knee or above, and the patient walks about for some time. If he then complains of increased discomfort it indicates inadequate return in the deep veins.

TREATMENT

From the standpoint of treatment varicose veins may be classified according to the accompanying table:

Type of varicosities	Constriction tests	Treatment
I. Mild localized varicosities.	Negative constriction tests.	Injection only.
II. Any degree of great-saphenous incompetence.	Positive Trendelenburg test.	High ligation, division, and retrograde injection.
III. Small-saphenous type.	Three-tourniquet test positive.	Ligation, division, and retrograde injection of small saphenous.
IV. Incompetent communicating type (thigh).	Three-tourniquet test proof.	Low thigh or condylar ligation, division, and retrograde injection.
V. Varicose vein with ulcer.	Positive Trendelenburg test.	High ligation, division, and retrograde injection.

Injection therapy alone is only useful in type I. In any other type, particularly in soldiers, injection is useless, because of rapid recurrence. We have had 24 cases with recurrence following recent injection therapy elsewhere. In these

cases the cause was valvular incompetence, as shown by constriction tests. The injection is done with the patient standing on a chair or stretcher. Sodium morrhuate, 5%, is used in doses of 2 to 5 c.c. A pad strapped on with adhesive is applied and the patient instructed to lie down for 15 to 20 minutes to prevent rapid dispersal of the solution. Injections are repeated every few day until satisfactory occlusion has been obtained.

In type II where incompetence of the sapheno-femoral valve has been demonstrated by a positive Trendelenburg test, high ligation, division, and retrograde injection of sodium morrhuate are done.

TECHNIQUE

The patient walks to the theatre having had the area of groin and upper thigh shaved. With the patient standing with most of his weight on the affected leg, the vein is marked with a wet indelible pencil, just below the fossa ovalis. In fat thighs the groove formed by the lateral border of the adductors is a good guide. Another method of finding the saphenous in a fat thigh is to tap the most prominent varicosity in the leg and a wave will be felt over the vein in the thigh with the other hand.

The area is then painted and draped, and about 10 to 12 c.c. of 2% procain infiltrated subcutaneously. A transverse incision 1 to 1½" long is then made. With a Halstead forceps and blunt dissection the vein, palpated by the finger, can be separated from the surrounding areolar tissue and brought up on the forceps. A ligature of No. 1 chromic catgut is placed as high as possible and tied with three knots. Any visible branches running up from below to above the site of ligature are divided and tied. A second ligature is placed loosely, with a first knot around the lower part of the vein.

The vein is cut partly across between the two ligatures and a cannula attached to a syringe by a rubber tube loaded with sodium morrhuate 5% is slid into the distal part of the vein and the ligature tightened about the cannula. Six to 8 c.c. of 5% sodium morrhuate are then injected. If the varicosities are very large 10 c.c. of solution (3½ to 4 c.c. of 10% sodium morrhuate diluted to 10 c.c. with distilled water may be used). The cannula is then removed, the distal ligature tied, and the division of the vein is completed. The wound is flushed out with normal saline or sterile water to remove any possible leak of sodium morrhuate and the wound closed with one or two vertical mattress sutures.

The upper ligature is placed high to be above the lateral branches but is just below the superficial epigastric. Only if there are marked varicosities in the upper lateral or medial aspect of the thigh is a wide dissection carried out, and the upper portion of the vein stripped up into the fossa ovalis and ligatured flush with the femoral, after tying all the

branches, as recommended by Stalker and Heyerdale.⁶

We agree with Barclay⁷ that wide dissection in this area increases the danger of infection of the wound from the disturbances of fat and lymph glands. We are dealing with soldiers and are anxious to do as simple and effective a procedure as possible. The procedure can be done in ten to fifteen minutes without an assistant. If only a very small vein is found, careful search must be made to be certain that an accessory saphenous or a medial or lateral femoral cutaneous branch has not been mistaken for the main vein. A pair of mastoid self-retaining retractors is very useful when the vein is not easily found.

The patient is kept in bed for 24 hours in order to lessen the bulk of the thrombus and increase the intimal contact of the sclerosing solution. He is instructed to move his leg frequently to lessen the danger of pulmonary embolus. In civil life a supportive crepe bandage might be applied and the patient sent home one to two hours after the operation. Usually within a few hours a discoloured streak appears along the course of the vein, and the thrombus can be felt. The patient is walking about after twenty-four hours. The sutures are removed on the seventh day and the soldier returns to his unit on the eighth to tenth day, on one week's light duty. This treatment produces a complete or almost complete obliteration of all the veins, but in about 15% one or two local injections are necessary to complete the thrombosis.

In bilateral cases an interval of two to three days is allowed before doing the other leg, to let the reaction from the first operation subside.

In large varicosities a groin and condylar ligation, division, and retrograde injection may be done at the one sitting with a retrograde injection of 4 c.c. in each. The condylar ligation is done first, the vein being picked up above the medial condyle of the femur. This produces an excellent obliteration. The condylar ligation is also useful in the few cases where groin ligation does not produce a thrombosis extending into the leg.

In type III the small saphenous vein is exposed in a similar manner in the popliteal space, and ligation, division, and retrograde injection of 4 to 6 c.c. of 5% sodium morrhuate performed. The vein is just under the deep fascia, which has to be divided to expose it. When small-saphenous and great-saphenous incompetence occur in the same leg, the ligation and injection of both may be done at the same time or the small saphenous done two or three days prior to the great saphenous.

In the rare type IV, when incompetent communicating veins in the thigh have been shown to be present, a ligation, division, and retro-

grade injection of the great saphenous well above the medial condyle is done. Extensive operations to dissect out the communicating vein are unnecessary. We have encountered four cases of this type.

In type V, provided the varicose ulcer is relatively clean, with no great activity of infection, high ligation, division, and retrograde injection of the great saphenous combined with an elastoplast bandage and ambulant treatment, produces excellent results.

ANALYSIS OF CASES

The above outline of treatment has been based on our experience with 375 ligations and retrograde injections, done on 231 patients in this hospital from August, 1940, to July, 1942. High-groin ligation was done for great-saphenous incompetence on 300 extremities. Forty-one small-saphenous ligations were performed. In 20 of these there was no associated great-saphenous incompetence. Condylar or low thigh ligation was used 31 times. In 4 of these cases it was done for incompetent communicating veins in the thigh. In 4 others, condylar ligations were done for recurrences following groin ligations done elsewhere, in which obliteration was unsatisfactory. The remainder of the condylar ligations were done as a supplement to groin ligation.

We have treated 12 cases of recurrence following groin ligation done previously in other hospitals. In 3 cases recurrence was due to too low ligation with missing of an accessory saphenous or a medial cutaneous branch. Ligation and retrograde injection of these was done with excellent results. In 2 cases recurrence was due to incompetent communicating veins and these were treated by low-thigh or condylar ligation and retrograde injection. Condylar ligation and retrograde injection was done on 4 cases in which obliteration was incomplete. In one case the cause of recurrence was small-saphenous incompetence which was treated by ligation and retrograde injection with complete obliteration of the varicosities. In two patients who had multiple ligations and excisions, with recurrence, high-saphenous ligation and retrograde injection produced excellent results.

Our results have been eminently satisfactory to date. During this static period surgical patients with recurrences were returned as far as was possible to the hospital at which they were treated. Out of 375 ligations only 3 have re-

turned with a few, small, localized, varicosities, which were cleared up by one or two local injections. Seventy-five ligations have been re-examined six to eighteen months after treatment and no recurrence was found.

COMPLICATIONS

The following complications have been encountered following ligation and retrograde injection.

1. Minor pulmonary embolism occurred in one case. This patient was 49 years old, of poor physique. He had a right-groin ligation done on September 24, 1940, and the left side was done on October 2, 1940. He remained in bed and refused to move around. On October 5, 1940, he developed a minor left pulmonary embolism from which he soon recovered. We feel that the cause was thrombosis occurring in his deep calf vessels, due to remaining quiet in bed.

2. Anaphylaxis occurred in one case. This patient had the right great saphenous treated on March 8, 1941, and the other leg done on March 11. On March 12 he developed a terrific reaction with marked oedema of the left leg, urticaria, asthma, and a temperature rise to 104°. Adrenalin was necessary for treatment of the asthma. It was found later that he was subject to asthma. It took eight weeks for the left leg to return to normal.

3. Transient superficial phlebitis of wandering type occurred in two cases three months after treatment. This rapidly improved after a few days' rest.

4. Continued oedema occurred in one case after treatment. This patient had chronic ulcers with marked scarring and oedema of years' standing. This oedema was improved but did not completely disappear.

SUMMARY

1. Perthe's test, as usually employed, does not necessarily indicate deep venous obstruction and, if taken as such, treatment may be denied to patients with small-saphenous or communicating-venous incompetence.

2. Injection alone in soldiers is useless except in low tension varicosities with negative constriction tests.

3. In great-saphenous varicosities of any degree with a positive Trendelenburg test, high ligation, division, and retrograde injection is the treatment of choice. This treatment is also

excellent combined with an elastoplast bandage in those cases with varicose ulcer.

4. Small-saphenous incompetence, either alone or associated with great-saphenous incompetence, as demonstrated by the three-tourniquet constriction test is much commoner than is generally known. Approximately 11% of ligations were done for small-saphenous incompetence. The treatment is ligation, division, and retrograde injection of the small saphenous in the popliteal area.

5. Condylar or low-thigh ligation, division, and retrograde injection is useful in cases with incomplete obliteration following groin ligation, as a supplement to groin ligation, or in communicating types of incompetence in the thigh.

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RÉSUMÉ

Le test de Perthe n'indique pas toujours l'obstruction des varices profondes. Sur la foi de ce test, on pourrait négliger de traiter les malades porteurs de petites varices des saphènes superficielles. La seule injection de morrhuate de sodium à 5% est inutile sauf au cas de varices faiblement tendues alors que les tests de constriction sont négatifs.

Dans les varices des grandes saphènes à test de Trendelenburg positif, le traitement de choix est la ligature haute, la division et l'injection rétrograde. Un bandage à l'élastoplast complète bien le traitement au cas d'ulcère variqueux. L'insuffisance des petites saphènes est assez fréquente: le même traitement sera appliqué à la zone poplitée. La ligature basse de la cuisse, ou condylienne, et l'injection rétrograde rendent des services dans les cas d'oblitération incomplète après ligature à l'aîne.

JEAN SAUCIER

TREATMENT OF SWEATING FEET.—Surg.-Capt. D. H. C. Given writes: The following method of treating sweating feet, introduced by the factory chiropodist almost 12 months ago, has proved most successful. Many of the patients returned to report that it was the first remedy after years of suffering that had brought real relief and cure. Procedure is as follows. Apply a lotion of 3% salicylic acid in a spirit base to the affected parts t.d.s., allowing it to dry off before replacing the footwear. A small quantity of the following powder should be dusted daily into the socks: salicylic acid 3 parts, starch powder 10 parts, talcum 87 parts. Improvement is usually manifest in three to four days, when the application can gradually be reduced to suit the case.—Cor. in *Brit. M. J.*, 1943, p. 632.

SULFATHIAZOLE IN GLYCERINE*

By Lt.-Col. Edward H. Wood,
R.C.A.M.C. (R.F.)

Ottawa

THE value of glycerine and alcohol in the treatment of tissue infection was well established some years ago.¹ Now the efficacy of the local application of sulfonamides has become generally recognized. In facing this situation the problem was how best to maintain the value of the former and adopt the latter. Another question arose as to the value of the advocated methods of application of the sulfonamides. As to the latter question it is evident that there are objections to the use of the powder as such.

With regard to vehicles for the powder, various combinations of petroleum products are suggested. The objection to these is twofold, in the main: (1) the petroleum acts as an inhibitor of the drug, in that it is waterproof and so seals off the drug from the tissues and bacteria to a substantial degree, which varies with the type of preparation; (2) such preparations cannot be left in the tissue cavities, as petroleum then becomes a foreign body, cannot be absorbed by the tissues, and therefore becomes walled off into pockets or encysted pools.

Another form of vehicle is a non-oily paste. These pastes are more or less firm in consistency and do not flow freely into cavities or interstices of wounds.

Coming back to alcohol and glycerine. *The alcohol element must be discarded.* It is incompatible with the drug, therefore, only the glycerine of this original combination could be retained to combine with the new drug. The value of glycerine, beyond being a suitable vehicle, may be summed up in the following modified quotation from the original article on alcohol and glycerine.¹

"A dehydrating agent such as glycerine causes a flow of lymph to the surface carrying with it toxic products of infection as well as the bacteria. It reduces the tissue swelling and intra-tissue pressure, thus allowing a greater blood supply. There is an increase in the determination of the system's antibodies to the infected part, thus assisting nature to overcome the infection. Glycerine, besides being hygroscopic in action, is definitely antibacterial, and so the bacteria discharged into the dressing become the prey to this action."

Sulfathiazole was chosen as being the most generally suitable in the types of cases under

consideration, though the other known preparations may be used if the type of infection should so indicate. It is likely that the future sulfonamides which may be produced as time goes on may also be exhibited in this vehicle. Several strengths of sulfathiazole in glycerine were tried. The result has been that 30% sulfathiazole in glycerine has been found generally the most satisfactory. No stronger mixture is suggested, but circumstances may require a weaker one, even as low as 5%. One of these circumstances is the sensitivity of some individuals to the drug.

The preparation is easily made. Simply mix the two ingredients in a clean mortar with a clean pestle; a smooth cream results which is put into a clean jar. There is no apparent need to sterilize the mixture. It is known for convenience as "sulfathiazole and glycerine cream 30%". This cream has none of the disadvantages of the other preparations. It is chemically stable. It is easily made and has a wide field of usefulness. It stands extremes of temperature well. It settles and requires "shaking well before using".

Sulfanilamide alone and mixed with sulfathiazole in varying proportions was tried. These preparations are not physically as satisfactory as sulfathiazole, alone, in glycerine. For example: if 10% of the sulfathiazole is replaced by sulfanilamide, i.e., 20% sulfathiazole, 10% sulfanilamide, glycerine q.s., the preparation resulting is a heavy paste which does not lend itself to a wide variety of uses and which tends to cake easily.

It will be noticed that it is merely necessary to see "that the mortar, pestle and container are physically clean". Attempts have been made in the laboratory to obtain cultures from the resultant mixture, but in vain. It is understood that all sulfanilamide powders now produced are sterilized at their source. There is no objection to sterilization of the utensils, except that it complicates the preparation of the mixture.

After more than a year of experience there are few evidences of unsatisfactory reactions. Not the slightest local tissue reaction has appeared. Considerable quantities have been sewn into the peritoneal cavity without the least sign of irritation. There is, however one condition wherein caution is urged, viz.; should there be a considerable area of non-intact skin, there seems to be excessive absorption, with a re-

* From the Surgical Service of the Ottawa Civic Hospital.

sultant more or less generalized dermatitis, which is distressing but which clears up shortly with the removal of the local application and may not return if a weaker mixture is used, say 5%. This untoward reaction has occurred in several cases of varicose ulcer with associated dermatitis. It is therefore advised that in all such cases the weaker mixture be used from the start and with caution. It should in such circumstances be applied to the skin, *i.e.*, painted on and covered with dry gauze. The gauze should not be soaked in the preparation before application.

The field of usefulness is large and has been well covered by many reports in the literature on the value of the powdered sulfonamides in their local application. Reed and Orr² have shown that the comparative value of the sulfonamides puts sulfathiazole in first place in its beneficial results in the prevention of gas gangrene due to the group of causative organisms as a whole. They also point out that the time element is most important, showing that up to six hours after the introduction of the spores sulfathiazole is most valuable, but with a more prolonged elapsed time its efficacy deteriorates in preventing the development of infection and gas gangrene. They also conclude from their investigation that "local treatment is superior to oral treatment". They bemoan the fact that the elapsed time in war wounds will, in general, be beyond the six hour period. Certainly the time before a wounded man can be operated on will, in far too many instances, be well beyond this period. This paper is presented to show how such an unfavourable situation may be alleviated.

Moorhead³ refers to the first six hours after injury as being the "contamination phase"; thereafter comes the "infection phase". He calls the first phase the "golden period" of treatment. Moorhead advises the free use of, preferably, sulfanilamide powder and especially in the sixth hour "contamination phase". The time element he maintains as the most important. There is total agreement with all this, but, how can sulfanilamide powder be successfully applied to penetrating wounds, be they into soft parts or cavities? Certainly on active service it will rarely be feasible to carry out operative treatment of wounds before six hours have elapsed. It is therefore herein urged that sulfathiazole and glycerine cream 30% or some similar preparation be on hand as far forward

or over as broad a field as possible and at the first opportune moment a catheter or cannula attached to a syringe (say 20 c.c.) be inserted as far as can be into all wounds and the entire wound area flooded with the cream, no matter where they be located or how complicated.

This need not be a sterile procedure and can be carried out by orderlies or stretcher bearers as well as medical officers. This cream will stand up under extremes of temperature and may be transported with facility. The cream resists contamination, and before the "infective phase", would appear to be inhibitory to a wide field of bacterial flora. This early and thorough application of chemotherapy should prolong the "golden period", postponing the "infection phase" to such an extent as to bring the great majority of wounds to operation before infection has occurred.

Dr. J. M. Murray, of our staff, has had an opportunity of applying the cream in conditions closely allied to those of active service. Following the Almonte railway wreck he treated six severe cases of compound fractures by debridement, injecting the cream into the site of the fracture and enclosing the limbs in plaster without suturing the wounds. All wounds remained clean and healed by granulation. The fractures healed in the normal time. There was no significant rise in temperature.

SUMMARY

1. A simple and practical vehicle for sulfathiazole is advocated, *i.e.*, glycerine.
2. Its wide field of usefulness in general surgery is outlined.
3. The probability of its value in war surgery is suggested and it is urged that it be given a thorough trial.
4. The value of the local application of sulfonamides has long since been accepted.
5. Attention is drawn to the "contamination phase" of wounds, and the early application of chemotherapy is advocated.

The first objection that will be made to this preparation is the glycerine content. So much glycerine is required for war purposes, etc. Well, this is a "war purpose". It does strike one as odd that the healing art should be classed as a "war purpose". This is due to the fact that we think primarily of the "sending end" of war and give secondary, yes, minor, thought to the "receiving end". Let us spare some of the glycerine for the receiving part of the "war purposes".

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Ottawa, Ont.

RÉSUMÉ

La glycerine est un véhicule simple et pratique du sulfathiazole. Ses indications chirurgicales couvrent un champ très vaste. On devrait l'employer davantage en chirurgie de guerre. Son emploi devra être précoce et précéder la phase de contamination des plaies. On ne peut invoquer la difficulté d'obtenir la glycerine,—produit précieux pour la guerre,—car le soin des plaies des soldats est bien aussi une fin de guerre.

JEAN SAUCIER

Case Reports

A CASE OF PELLAGRA

By P. Coodin, M.D., L.M.C.C.

Fort William, Ont.

History of illness.—A.D., a Polish workman, aged 62, was admitted to the McKellar General Hospital on July 31, 1943, with an eruption on his hands and forearms. The illness began six weeks before admission, with swelling and inflammation of both hands. Within a few days the rash had spread around both forearms; several blisters appeared and burst open, leaving dark red, moist, ulcerated patches. In the spring of 1932 he had had a similar rash on his left lower leg, that had lasted for several weeks and then healed over, leaving the skin in this area brown and scaly. He thought that his skin was sensitive to cold, as his hands used to get red and swollen during the spring months for the previous few years.

Since last January his appetite had been poor; he felt "out of sorts" and quite exhausted after the day's work. He had lost 15 pounds in weight in 3 months. His diet for the past 15 years seems to have been very inadequate, consisting almost entirely of bread, cereals, jams, vegetable soups and tea, with milk, eggs and cheese taken only occasionally. He had an aversion for meat since childhood, the only period he remembered having eaten meat regularly was when he had been serving in the Austrian army before the first world war. Following the death of his wife in 1919 he had been boarding with a private family for about 5 years, but since then he had been living in a small shack with another bachelor doing his own cooking and partaking of hot meals infrequently and irregularly. His consumption of meat was limited to a few ounces of beef once a week or less often.

The family history was negative.

Physical examination.—The temperature on admission was 101.4°, pulse 110. The temperature fluctuated between 99.5 and 101° for 5 days and then remained normal. He had 8 fang-like upper and lower incisor and premolar teeth left. These showed marked purulent discharge and recession at the gum margin. The gums appeared pale and puffy. The tongue was flabby, furred and fissured in the centre, but glazed and showing indentations of the teeth at the edges. The throat was normal. Chest and abdomen were negative. The apex beat of the heart was palpated ½ inch outside the left mammary line in the 5th

intercostal space. The heart sounds were of normal intensity and regular rhythm. Blood pressure 164/96. The deep tendon reflexes were normal.

Fractional gastric analysis showed complete absence of hydrochloric acid and the low titre of 12 for combined total acids 2 hours after a test meal. The blood examination was not done until the 14th hospital day and the blood picture may have been modified by treatment. It showed 5,120,000 red cells; 10,250 white cells; hgb. 80%. A differential count yielded 49% polymorphonuclears, 40% lymphocytes, 5% transitionals, 4% monocytes, and 2% eosinophiles. The urine was normal.

The skin of the face and lips and that over the sternum, anterior aspect of the knees and back of the elbows was markedly dry and scaly. Over the middle third of the left tibia there was a large patch of deeply pigmented, keratinized brown, inelastic skin, apparently the result of the eruption he had over this area in 1932. Numerous small spots of brown pigmentation were scattered over both lower legs. The patient had a symmetrical bullous eruption from the tips of the fingers to the middle of the forearms, extending farther on the extensor than on the flexor aspects. In this area there was marked oedema of the skin, with the epidermis thickened, keratinized and desquamating in several places, and denuding dark red, weeping, granulating surfaces of cutis vera. A diffuse erythema with petechial spots extended from the middle of the forearms to just above the elbows.

The patient was given a high caloric, high vitamin diet together with daily doses of 800 mgm. nicotinic acid administered orally and intravenously and 20 U.S.P. units of concentrated liver extract intramuscularly. Within 15 days he gained 5 pounds in weight; his skin lesions completely cleared up and he was discharged from the hospital in a much improved general condition.

In most of the sporadic cases of pellagra reported in the literature the commonest early symptoms were referable to the nervous and digestive systems with changes in the skin only secondary and appearing some weeks or months later. The distinctive feature of this case was the predominance of the skin lesions that were insidious for about 10 years while the nervous and gastrointestinal complaints were very mild and subclinical.

BILHARZIASIS IN CANADA

By Walter P. Hogarth, M.B.(Tor.), F.A.C.S.

Fort William, Ont.

Bilharziasis is a urological disease endemic in Egypt, and fairly prevalent in adjacent areas of the Mediterranean, but almost unknown in this continent. However, the disease can be transported into this country, as proved by the diagnosis of isolated cases. In view of the fact that we shall soon have members of our armed forces returning from service in all parts of the world, the following case history is reported. It may serve as a reminder that a look-out must be kept for signs and symptoms of

disease not ordinarily encountered in Canada.

Bilharziasis is barely mentioned in urological textbooks published on this continent. The most complete article I have seen is in Thomson-Walker's Genito-Urinary Surgery, page 475. As with other such diseases, one should not expect to encounter the classical disease picture in an isolated case but should be satisfied with certain signs and symptoms. These, however, must be very definite to justify a diagnosis.

CASE HISTORY

T.L., male, Finn, aged 23, was referred to me by Dr. G. E. McCartney for urological study in September, 1924. He was born in Finland, served one year with the Russian army and spent part of that time in southwestern Russia. He came to Canada in 1923 and worked for that year as a labourer in pulpwood and road camps.

Two months before admission he began to have intermittent pain in the lower right side of his abdomen. Shortly afterwards he had a swelling of the left testicle which quickly subsided. His hospital records show that the only constant finding was intermittent pain in the appendiceal region. A gastrointestinal barium series was reported as negative except for hyperperistalsis of the stomach noticed at fluoroscopic examination. The urine showed a trace of albumin, and an occasional pus cell, many epithelial cells, and many red blood cells. A plain x-ray film showed no abnormal shadow.

September 6th.—An F24 cystoscope entered the bladder easily. The bladder was of good capacity. Washings were clear and free from gross blood. No calculi, tumours or foreign bodies were seen. It was noted that throughout the whole bladder wall the blood vessels were much engorged, like a fiery network across the bladder wall. There was considerable congestion of the trigone and around the ureteral orifices. The orifices were normal in position and were patent. F6 catheters entered and passed up the ureters without difficulty. It was noted that, when the tip of the catheter touched the bladder wall, the area became very red. Specimens were secured from both kidneys and a phenolsulphonphthalein function test (intravenous) was done. The dye appeared in each urine in three minutes in good concentration. A few minutes later there was a free flow of red blood from the right catheter. This was so marked that the catheters were withdrawn and the examination discontinued, hence, no pyelogram was secured. The bleeding continued freely for twenty-four hours, then subsided.

Our search for a diagnosis was finally rewarded when one of the laboratory technicians, Mr. James Thompson, asked if these cells we had been considering as atypical epithelial cells could possibly be the ova of bilharzia? The patient was studied with this condition in mind. Several specimens of urine, examined on successive days, showed these cells as a constant finding. His white blood count was 7,800, with a differential of polymorphonuclears 37%, large lymphocytes 15%, small lymphocytes 17%, transitional 8%, eosinophils 23%.

This seemed to justify a diagnosis, and treatment with tartar emetic intravenously was instituted as follows: September 9.—½ grain tartar emetic in 5 c.c. saline; September 10.—1 grain tartar emetic in 5 c.c. saline; September 11.—1½ grain tartar emetic in 5 c.c. saline.

On September 12, an Ontario Travelling Clinic visited our hospital. The leader of this group was Dr. W. T. Connell, Professor of Medicine at Queen's University, who confirmed our diagnosis. A specimen

taken this day was the first that failed to reveal the ova.

The patient received seven more injections, each of 2 grains, at forty-eight hour intervals. There were no reactions or recurrences of urinary or any other symptoms. October 1, differential white count: polymorphonuclears 50%; small lymphocytes 31%; large lymphocytes 11%; transitionals 4%; eosinophils 4%.

The man was discharged from the hospital, symptom-free, and was asked to return for observation. I have not seen him since and a recent attempt to locate him through the Finnish Consulate was unsuccessful.

Clinical and Laboratory Notes

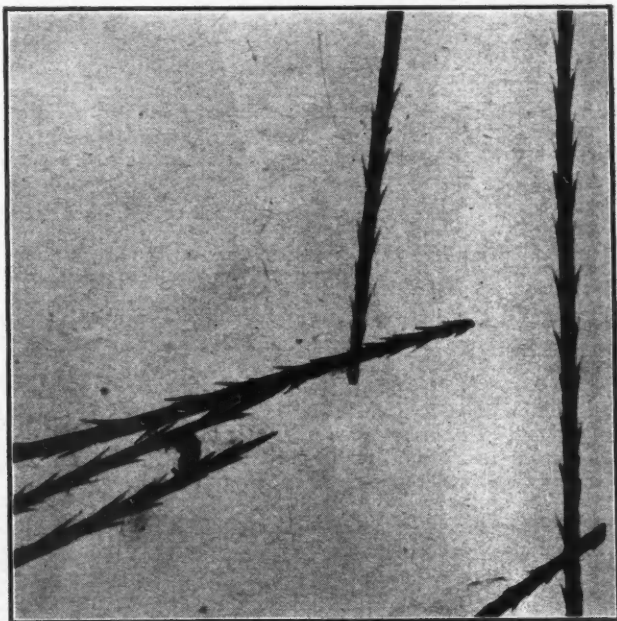
CATERPILLAR HAIRS IN "APPLE BUTTER"

By H. T. Güssow

Dominion Botanist

Ottawa

The presence of rusty brown and black barbed setæ, 4 to 6 mm. long by 1/10 of a mm. wide, in the tissues of mouth, tongue, tonsils and throat generally is extremely difficult to detect, and the setæ are still more difficult to remove. A patient complained to his physician of dis-



comfort in mouth and throat following the eating of apple butter. The physician discovered the setæ as stated and also found them in a sample of the suspected apple butter.

The accompanying microphotograph shows the barbed setæ much enlarged. They were identified as the hair of the "woolly bear" caterpillar (*Isia isabella*). While not poisonous in any sense, these hairs are decidedly irritating, even in less sensitive situations (hands, etc.) than the mouth and throat. They may also

constitute perfect inoculation needles to introduce pathogenic organisms—and because of their being, possibly, pure chitin may persist for a long period. The occurrence of the sur-

prisingly large number of these setæ in the apple butter would indicate gross negligence of hygienic precautions on the part of the manufacturer.

Editorials

THE PHARMACEUTICAL MANUFACTURERS' VIEW OF HEALTH INSURANCE

A PAMPHLET entitled "Health Insurance for Canada" has been published and given wide distribution by the Canadian Pharmaceutical Manufacturers' Association. Anyone is at liberty to write on Health Insurance, and, naturally, there are differing opinions on the subject: these self-evident propositions may or may not justify the publication of any given pamphlet, but that we shall not try to decide. The particular pamphlet referred to, however, does call for our protest against certain of its aspects.

It is described in its sub-title as "A Digest of Information", which means, we suppose, that it is a source of facts about Health Insurance as proposed in Canada. Now, a plain statement of the facts regarding the legislation pending in this field is to be welcomed by everyone interested in the subject. But when the contents of such a statement are so arranged that it is difficult to distinguish between the facts and the colour which is so unobtrusively applied to them in their interpretation, then we question the value of such a source for those who seek accurate information.

We are not now discussing the pros and cons of health insurance, and we neither admit nor deny the force of the arguments adduced in this pamphlet. Our only concern is that its interpretation of the facts shall not be confused with the facts themselves. As it is, the pamphlet is only a piece of propaganda, and anyone who turns to it for enlightenment as to the facts about health insurance, should use some form of mental reverse prism to reconstitute from its strongly coloured spectrum the pure white light of fact alone.

One particular aspect of this propaganda concerns the medical profession directly. We feel that a reading of this pamphlet will inevitably leave the impression that the pending health insurance legislation is being

supported by the profession in order to increase its own financial returns, and this by discrimination against various sections of the community. The phrasing has been so skilfully managed however, that this malevolent design of ours is nowhere set forth in so many words. And equal skill has been used in omitting to state such *facts* as: (1) that our profession has had no part whatever in framing or guiding health insurance legislation; (2) that we have always reserved the right to examine and criticize any proposed legislation of this nature; (3) that we have recorded frequently our desire first to help in providing the best possible medical service to the people.

In addition to these carefully planned omissions—or are they merely oversights?—we find that plenty of space has been kept for references to the claims of chiropractic, osteopathy and chiropody. These claims are not critically examined. They are left floating in a state of suspended animation, so that the uncritical, or uninformed, or sympathetic, or all three, will not hesitate to draw them in to their minds as accepted facts. We find, too, a casual but quite explicit reference to statements made by a witness before the Committee on Social Security leading to a suggestion on his part that the average doctor in Canada is already receiving an income of \$10,000 per annum. This "twilight fantasy" also is left lying about for anyone who cares to play with it. Just as carefully casual, and equally unqualified, is the reference to our profession as a union.

The whole subject of health insurance presents difficulties and potential effects on the health services of the country, as well as on the Canadian medical profession, in an extreme degree. We wish to correct the impression that the Association has either prepared legislation (an absurd assumption), or that it has committed itself, and the profession, to unthinking and unquestioning support of any legislative measure.

COD-LIVER OIL IN CANADA

AT the outbreak of war Canada was producing no medicinal cod-liver oil at all: our refined supplies all came from Norway, Great Britain and Newfoundland. We are now exporting cod-liver oil to the United States, South America, South Africa, the British West Indies, Australia and New Zealand, and for relief purposes in Europe, and the business is growing.

This very notable development has grown directly out of the exigencies of the war. Very early in the war Great Britain ceased to export cod-liver oil, and we then began to think about our own sources. The fall of Norway completed the deprivation of outside supplies and the Board controlling fats and oils set themselves the task of producing our own supplies entirely. The problem fortunately was not one of raw material. Of that we have enough and to spare, and of very high quality. For instance, Canadian cod-liver oil has a vitamin content, especially vitamin A, far above the B.P. and U.S. Pharmacopœia requirements. But Canada had never produced anything more than the crude oil, and that was frequently of an indifferent quality, because of the methods of production. The sight of barrels full of rotting livers was a familiar one in our East coast fishing villages. But this was a crude and wasteful method, and the product was fit only for tanning and commercial purposes.

What was needed was organization of the industry, and this meant not only refineries but equipment of the fishing schooners so that they could deal with the livers while at sea and so prevent the deterioration which occurs if they are not properly preserved. There are now five modern refineries on the Eastern coast, and work is in progress to still further improve the methods of extraction.

There are other fish liver oils of great value for their vitamin content, notably the halibut and dogfish. The West coast fisheries provide large quantities of these, notably the dogfish liver oil, a great proportion of which has been contracted for by the British Ministry of Food. This oil has a high vitamin A content, and this is used in concentrated form for fortifying margarine and for feeding flyers to counteract night

blindness. The value of these vitamin oils in the food supplies of the British nation is not over-estimated in the statement that they can be regarded in the same category of importance to the war effort as guns and tanks.

Editorial Comments

Conference of National Health Organizations on Health Insurance

It has been felt for some time that there should be an attempt to bring together the various groups concerned in national health, in order that they might discuss the common problem of health insurance. To this end our Association arranged a conference on January 28-29, which was attended by delegates from 14 such groups, representing organized medical bodies, public health, teaching and research, nursing, hospitals, French-speaking physicians, dentists, and pharmaceutical interests. This made up a complete cross section of our medical world, and there was an unusual interest in the presentation of the various viewpoints. The central theme of course was health insurance as it concerned each organization. The Chairman, Dr. A. E. Archer, pointed out that the meeting was to be a clearing-house for opinion rather than an occasion for definite action. The Conference really was made up of a group of organizations tied together by common aims, and as such it had no authority to speak for any one group. However, there could be no objection to any one or more groups recording resolutions as they saw fit. These would appear as from their separate sources in the records of the Conference.

After each group had presented its summarized views on the matters of chief concern to itself in health insurance, discussions took place on two main subjects: (1) What features should be included in any plan of health insurance to ensure the best form of health care in, (a) rural areas and (b) urban areas? And (2), the relationship of health insurance to professional training and its possible effects on clinical teaching.

The following session was devoted to a panel discussion of questions from the floor, and this was succeeded by a discussion on the subject of general enlightenment of the public.

The only comment to be made at the moment is that the conference fully served the purpose stated by Dr. Archer, so much so that the opinion was voiced in more than one quarter that other similar meetings should be held from time to time.

Human Behaviour in Relation to Industry

We have become accustomed to the rapidity of technical developments in the industrial world. Even the most superficial view of these however, cannot be entirely complacent. There is no avoiding the conflict that must arise when materials are assigned greater importance than the human beings engaged in producing or using them. And yet, with all our tremendous expansion in industrial production there has been very little attempt at a corresponding improvement in its relation to the human beings concerned in it. As the executive of one large company put it:* "It is shocking when we contemplate how far behind we are in the techniques, or arts, or methods of handling people. The development of the science of living and working together is far behind that of the science of production".

Now there is a medical element in this problem, and its recognition has prompted the recent inauguration at McGill University of a series of lectures which is probably one of the first of its kind in Canada. Lectures on industrial medicine are a well established part of medical teaching; and psychological studies of such industrial problems as fatigue, etc., are familiar. But few attempts have been made in Canada to examine thoroughly the problems which arise directly from the factor of human behaviour in industry, or to show how successfully many of these can be dealt with by psychological methods. Nowadays the machine is not so much disregarded as it is subordinated to its proper importance relative to those using it. In other words, human beings are now being regarded not as mere living machines complementary to inanimate mechanisms, but as men and women whose working capacity has to be appraised, both in regard to specific "jobs" and their relationships with fellow workers and employers.

This point of view has its analogy in the methods of personnel selection in the army of today, where the attempt is made to give men work for which they are best suited, thus making the best use of them. Of course industry has its trained and specialized workers but in all large companies there is need for continual regulation and selection. A mechanism of steel presents no problem until it becomes worn out or outmoded. Then the scrap-heap receives its unprotesting remains. The employee, on the other hand, may present problems from the first day of his employment, but the solution of these is not by the summary, unquestioning method. It is here that the modern plan of understanding and appraising the capacity and circumstances of the worker comes into play.

The course of lectures referred to is to cover the many aspects involved in this subject,

* Mr. J. C. Cushing, Vice-president, the National Breweries Limited, Montreal.

psychological chiefly, but is best described under the all-inclusive term of human behaviour. We hope to publish some of these lectures, and have begun with the opening one by Dr. H. G. Ross, in the present issue, in which the general aspects of the subject are excellently presented.

Medical Advertising

The advertising of proprietary medicines in the public press of Great Britain is now subjected to rigid control under a ruling by the Newspaper Proprietors Association. The following regulations will be enforced:

1. (a) No advertisements will be accepted for any medicine or treatment advocated as effective in Bright's disease, cancer, tuberculosis or consumption, diabetes, epilepsy, fits, locomotor ataxy, cataract, glaucoma, disseminated sclerosis, osteo-arthritis, spinal cerebral and venereal diseases, lupus, or paralysis, or for preventing any of those ailments. (b) For the cure of amenorrhœa, hernia, blindness, rheumatoid arthritis, or any structural or organic ailment of the auditory system. (c) For procuring miscarriage. (d) For the treatment of habits associated with sexual indulgence or of any ailment associated with those habits.

2. No advertising will be accepted which undertakes diagnosis of disease by correspondence or treatment by the same method of any of the diseases first named.

3. Testimonials will not be accepted other than actual views of the writer, or from recognized British practitioners.

4. Illustrations conveying false impressions will be refused.

5. No product may be advertised as emanating from any hospital or official source, unless proper authority has been obtained.

In addition to these regulations all advertisements will be subjected to medical scrutiny.

We warmly support this policy and strongly commend the example of the British press to our own newspapers and radio.

**Alexander Primrose, C.B., M.B., C.M.,
F.R.C.S. (Eng.), LL.D.**

The passing of Dr. Alexander Primrose removes a notable personality. Full details of his life will be published later on, but at present we would pay to his memory the tribute of our Association for his long and valuable services to organized medicine. He held office both as Chairman of the Executive Committee and as President of the Association, and at all times gave generously of his time and talents. Others will speak of his personal characteristics; here we would only dwell on his length of service and the genial commonsense which he so constantly showed.

Medical Economics

THE INTEGRATION OF PREVENTIVE AND CURATIVE MEDICINE IN HEALTH INSURANCE*

By D. Sclater Lewis, M.D., F.R.C.P.(C)

Montreal

The subject under discussion is the closer relationship of the preventive and curative branches of medical service and the changes which may be required to make them most effective under health insurance.

The Canadian Medical Association welcomes this opportunity of presenting its views, for two reasons—first; to show its appreciation of the great importance of preventive measures in the care of the public, and second; to give added proof of the fact that as a profession the preventive and curative branches are united in the desire to provide a better health service for the people.

DEVELOPMENT OF PUBLIC HEALTH WORK

From the historical point of view public health may be said to have taken on a new tone shortly before the beginning of the last war. While environmental measures such as water supplies, sewage disposal, light and air supplies, had received some attention for many years, it was only in the earlier years of this century that public health authorities became interested in the communal care of the individual, with the introduction of special services regarding maternal welfare, the care of infants, of children in schools, etc.

"Unfortunately", as Viscount Dawson of Penn says, "although all credit should be given to the founders of communal health services, they tended to rear these services in bureaucratic isolationism. They did not secure the active participation of the whole profession. The fault was not entirely theirs. It lay in equal measure with the Royal Colleges, the teaching hospitals and their staffs. Their minds were held within the ancient confines of curative medicine and were blind to the enlarging opportunities opening out before them. The result was a gulf fixed between preventive and curative medicine which has now to be bridged."

While this was true in Great Britain, I do not believe it was ever so sharply defined on this side of the water. While the two branches may have been separated at certain points, still they have maintained a considerable degree of contact; but if the health of the public is to be more fully served, there should be even greater collaboration in the future should health insurance be introduced.

We have defined our attitude to health insurance legislation in the following resolutions:

1. That the Canadian Medical Association approves the principle of Health Insurance.

* Address given before the Canadian Public Health Association at Toronto, in December, 1943.

2. That the Canadian Medical Association favours a plan of Health Insurance which will secure the development and provision of the highest standard of medical services, preventive and curative, if such a plan be fair both to the insured and to all those rendering the services.

Our Association stated before the Special Committee on Social Security that one of the objects of the Association is to promote the public health, and that "The purpose of this submission is:

1. To emphasize that adequate medical care is essential to the welfare of Canada.

2. To review certain factors which handicap the medical profession in providing adequate medical care.

3. To point out that highly desirable preventive and Public Health services are now inadequate."

Health should be regarded not in the negative sense of the absence of disease, but as a positive matter. In any plan of social security due recognition should be given to improved employment, improved housing, nutrition and physical fitness if a well balanced plan of health service is to be evolved.

OUR EMPHASIS ON CURATIVE MEDICAL SERVICES

While we believe that the provision of curative medical care for all should be an important part of health insurance, we are not unmindful of the importance of preventive medicine. In our brief is noted the fact that many highly desirable preventive and public health services are not being provided because of the lack of sufficient funds. "It is unfortunate that while in the past money has been freely available for so many other purposes, yet so much difficulty has been encountered in obtaining adequate funds for effective programs of preventive work and public education on health matters."

In the succeeding pages of the brief are developed our ideas regarding the rôle of preventive medicine. The family doctor going in and out of the home should be the first line of defence. He should be responsible for a wider use of protective inoculation and vaccination. His activities in the important fields of hygiene, sanitation, periodic health examination, maternal welfare, and the correcting of children's defects both mental and physical, are all emphasized. A more vigorous attack by the profession on the problems of cancer, tuberculosis and venereal disease is advocated.

Both the Public Health and Canadian Medical Associations are therefore in complete accord regarding the necessity of increased activity in the preventive field by all concerned in the provision of health service.

The Canadian Medical Association, however, does not support the administration of the Health Act by a government department. While we agree that the contact with ultimate authority, Parliament, should be through the

Minister of Health, we feel that in the Provinces the administration should be by means of an independent corporate body or commission. We fear the vicissitudes of political life and wish administration to be removed from that turbulent arena.

THE FAMILY PHYSICIAN IN PREVENTIVE MEDICINE

While there is general agreement that the successful operation of the plan will depend largely on the family doctor, there has been more abstract than objective thinking as to how his services can best be used in the preventive field. The answer probably lies in greater co-operation between the practising physician and the public health service. It will mean adjustment on both sides, a change in the point of view.

Under the present methods of practice the family physician thinks of his patients mainly as individuals, whilst the public health department deals with the population in groups.

The physician tends to preserve the individual contact. So many of his professional problems are personal ones: the idea of professional secrecy is deeply rooted. While open confession is known to be good for the soul, the patient is a long way from desiring public discussion of his troubles by his physician.

Publicity is therefore abhorrent to the family doctor; he is a dead loss to the press.

On the other hand departments of health quite rightly have no qualms about publicity. They use it freely. They welcome press notices of their work and rely on these notices to educate the public to expect and demand services which will raise the standard of health. They use publicity to break down popular resistance, because, after all, John Citizen does not welcome sudden changes in his mode of life. An excellent example of this was reported in the *British Medical Journal* under the title of "Demolitionitis During the London Blitz". This did not mean a nervous reaction to the horrors of the blitz but rather the mental upset which followed the removal of slum dwellers from their familiar but ruined surroundings to relatively ideal homes, where there was good plumbing and plenty of light and air, but where there was none of the old associations and social amenities, such as the corner "pub". It was a good example of the effects of sudden change without adequate public education.

Again, public health has depended a good deal upon team work, while the conditions of private practice have tended to accentuate the individualistic side of the physician, and to produce a professional isolation which the general practitioner himself is the first to deplore. This, of course, does not hold with regard to his position in the community. The family physician usually heads the list in any local endeavour and his influence is always on the side

of progress; but the irregularity of working conditions makes for sporadic rather than continuous effort in this regard. He is compelled to give 24-hour service, 7 days a week, often 365 days in the year. No wonder then that his efforts may appear slow in getting results as compared with the full time office man with a staff to take much of the bounce out of emergency calls.

CO-OPERATION IS THE SOLUTION

How then are we to integrate these two services so that the desirable features of each may be most usefully employed? Team work is the answer. Medical research produces the material, public health services should popularize it, the physician should apply it. If education in the value of health is to be deeply impressed upon the public the family doctor who comes into the closest contact with the people must of necessity be an important public health teacher. This will require a keener consciousness of the place of preventive medicine on the part of those in practice.

Certain changes will be required to make use of this latent force. It has often been thought that departments of health have tended to invade the clinical field, but under the proposed system they would make a fuller use of the services of the family doctor. It is suggested that there should be a more general use of the organization of the health department to prepare the work for the practitioner. A logical point of contact between the two would be the public health nurse, or perhaps better called the Health Nurse. Her services could be employed in gathering groups for inoculation, for well-baby clinics, for antenatal and postnatal examination, thus saving the doctor's time and making sure that the ground was adequately covered. The arrangement of this service would be an important factor in the successful operation of the plan.

One would also foresee in the wider use of the small hospital a very definite point of contact between the public health official and the practitioner. Many of us have forgotten that the days of the horse and buggy doctor have gone. In those days the patient could be seen at his home or even by the roadside almost as well as at the doctor's office or the hospital. This is all changed. Medical science uses many instrumental and mechanical aids and these cannot be carried about the countryside. The logical place for the examination of all except the bedfast sick, is in the well-equipped doctor's office or hospital. The patient should come or be brought there. This is the practice in many communities at present. We hear of nine-tenths of all maternity work being done in the community hospital. Such hospitals suitably located and equipped according to local needs would do much to give the country doctor the tools and opportunities to practise the type of

medicine which he has been taught in the medical school. They would abolish his feeling of isolation and frustration. They would be the logical place for the health nurses' office and would afford an opportunity for personal contact between the district medical officer of health and the local practitioner. It has been this impersonal and very intermittent contact between the health department office staff and the general body of practitioners that has been the cause of many of their misunderstandings and jealousies in the past.

Such a plan would require a considerable increase in the resources of the medical services both personal and financial. It presupposes a larger use of the nurse with public health training, not only in the type of work which is now done, but in a new rôle of part-time assistant of the local doctor. It assumes a considerable increase in the number of full-time officers of health serving large enough districts to make their employment an economical one. It envisages a new type of practitioner, one who from his college days has been made fully conscious of the needs of social medicine, who will make full use of the facilities which are available, and who will look forward to general practice as an opportunity to make use of the skills which he has learned at medical school, rather than the restricted field which at present is all that is open to those who practise without a hospital connection.

Under such conditions many of the disadvantages of rural practice would be removed, and with adequate remuneration, suitable facilities for practice and contact with the medicine of larger centres there should be a reversal of the present trend of practitioners towards the towns and cities away from the country.

To provide this added professional staff would require a definite expansion of our medical schools and schools of nursing. Our wartime acceleration of courses has proved to be an unsatisfactory plan, and it may be necessary to increase the number of medical schools and training schools for nurses. This is a point which should be kept in mind by those who are drafting the legislation. At present they do not seem to have realized that if we are to have the required number of doctors and nurses to operate the plan grants in aid of general medical and nursing education are just as necessary as are grants for postgraduate instruction in public health.

CONCLUSIONS

If then we are to have a proper integration of preventive and curative services under Health Insurance four things are essential:

1. A clearer understanding of the aims and methods of the public health branch by the general practitioner, and a similar understanding by the health officer of the difficulties and differences in methods of private practice. How-

ever, we are all physicians, whether internists, public health officers or general practitioners; we have one common aim, the prevention and cure of disease.

2. More frequent meetings of all those concerned in the provision of health services both curative and preventive, so that they may know each other as persons rather than as officials.

3. Planned co-operation between the two branches so that the best results can be attained.

4. Further education of the public so that they will recognize the necessity of co-operating with the health services if these services are to reach the highest degree of efficiency.

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HEALTH INSURANCE AND MEDICAL EDUCATION

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All are aware that a nation-wide scheme of Health Insurance will effect many changes in the conduct of medical practice, but few have considered what effect such a scheme will have on medical education. A survey of the bulky report on Health Insurance issued by the special committee on Social Security of the House of Commons, Ottawa, brings out two points: the emphasis on the prevention of disease, and the importance of the general practitioner in carrying out this program of prevention. Among the briefs submitted to the committee was that of the Canadian Federation of Agriculture. This brief submitted that the primary purpose of the plan should be the promotion of positive health and the prevention of disease. It visualized the general practitioner as the very foundation of the success of the plan. The Federation contended that this would mean an entire change in the attitude of our medical schools, the education of all health personnel, and the proper integration of research.

If this view is shared by a majority of the people of Canada, and it seems likely that it will be, then the points mentioned above will be written into the new plan. Health Insurance will then come to mean exactly that; namely, a plan whereby the maximum in good health will be assured to every member of the community. In that event the primary aim of doctors will be not to cure sick people but to keep people well. This is a noble ideal, but to bring it about means a revolution in our social thinking. It may not be possible at once to bring about this revolution, but there can at least be evolution looking toward such an ideal. In any

event it will entail a change in medical outlook and therefore a revision of medical education.

The medical school of the future must teach prevention of disease much more extensively than at present. Prevention of disease will come to mean much more than inoculations, vaccination, pasteurization of milk and purity of water supplies. It will have to take into account subjects which may be grouped under social medicine: prevention of slums; ventilation, heating and lighting of homes, factories and mines; hours and conditions of labour, and the problem of child labour; inspection of food and food handlers; a campaign against venereal disease; questions of social security such as unemployment insurance and old age pensions; town planning with provision of parks, public baths and playing fields. The medical man must be so trained that his advice on town planning will be as essential as that of the architect and financier. Oxford now has a Chair of Social Medicine and other medical schools must follow suit.

Another necessary work will be the planning of postgraduate courses for general practitioners. In these courses special emphasis should be placed on the detection of the beginnings of disease, or those departures from the normal which, if unchecked, will lead to ill health. This was the dream of the late Sir James MacKenzie. Whether attendance on such courses should be made obligatory is of much less importance than that they should be well presented, and that no penalty should attach to the practitioner who attends them.

Side by side with undergraduate teaching and the provision of refresher courses must be the encouragement of research. Those young students who are especially fitted to undertake research problems should be actively helped and directed. It is cheering to note that groups outside the medical profession see the need for research.

The question has been raised whether the teaching in our medical schools, which even more than now will be concerned with turning out general practitioners, should be entirely in the hands of specialists. The answer would seem to be that each subject should be taught by the man best qualified by training and experience to teach it. Proper balancing of the hours of instruction allotted to each subject would prevent any tendency to train specialists rather than well-rounded practitioners. If it is feared that the instruction given in medical schools today is too academic, consideration might be given to a scheme whereby the medical student might spend three to six months of his course as apprentice or assistant to a good rural practitioner.

Since the average age of Canadians is tending to become higher, and since cardiovascular disease ranks as the leading cause of death, medical schools might well give instruction in geriatrics, or the study of diseases of old age.

It is true that some schools have made a beginning along the lines suggested, such as the creation of a chair of Preventive Medicine, but even this beginning must be extended. The great interest taken by the general public in health insurance renders inevitable some revision of the present medical curriculum.

Medical Arts Building.

Retrospect

CERTAIN VIRUS DISEASES OF THE EYE*

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Viruses are disease-producing agents which cannot be classified as bacteria, fungi, protozoa, spirochaetes, or rickettsia, which differ markedly in their effects upon tissue cells, either stimulating or destroying, and which in particle size lie near or below the limits of the ordinary compound microscope. "We may define the filterable virus as a particulate agent, probably endowed with life, of a size which permits it to pass through the pores of the ordinary candle filters. As a rule it is ultra-microscopic though there are exceptions. It is related in many instances to the formation of intracellular inclusion bodies (cytoplasmic, intranuclear, or both)" (Gay *et al.*¹).

The distinguishing properties of viruses are, first, that they are obligate cell parasites unable to multiply apart from living cells. Secondly, they are able to pass filters which retain all ordinary bacteria, and thirdly, most of them produce cytoplasmic or nuclear inclusion bodies in susceptible cells. The particle size of viruses varies considerably; from 8 to 12 μ of the foot and mouth disease virus to 300 μ of the psittacosis. Viruses appear in the nature of cell inclusions and most cytoplasmic virus inclusions are now known to represent micro-colonies of virus in which the virus lies in a matrix of variable composition which very probably is a cell-reaction product. The nature of the nuclear inclusions is not yet established. When an inclusion ruptures virus particles are freed and are known as elementary bodies, and in some cases these, when properly stained, are quite visible with the ordinary compound microscope. Viruses have greater affinities for particular tissues than have bacteria. For instance, the virus of vaccinia is capable of infecting ectodermal, entodermal and mesodermal cells, while others develop only in one particular host and in one particular cell type. Another character-

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istic of viruses is their profound effect on cells, some causing cell necrosis, such as the yellow fever virus, while others cause pure cell proliferation. It has not been possible as yet to cultivate viruses apart from living cells, so that their biological nature has not been established.

A number of the viruses are of considerable ocular importance. Involvement of the conjunctiva and cornea is a frequent and severe complication of smallpox. Vaccinia may affect the lids and the conjunctiva and cause severe corneal lesions. Herpes simplex is the cause of occasional lid and iris lesions and the cause of dendritic keratitis. This virus is readily demonstrated in lesions by transfer to the rabbit's cornea. Herpes zoster may also produce corneal lesions. In varicella, in which the cornea is very frequently involved, complications such as iridocyclitis, scleritis, ocular palsy, and optic neuritis have been frequently reported. Among the so-called filterable viruses there are several which cause quite characteristic ocular lesions.

The eye may be the site of lymphogranuloma venereum lesions during any of the periods of this disease, and any structure of the eye may be involved by the process. All structures in direct contact with the exterior may serve as the site of inoculation for this virus conclude Espildora and Coutts.² Two common eye diseases caused by viruses are important, trachoma and inclusion conjunctivitis.

Trachoma or granular ophthalmia, or Egyptian ophthalmia, is a chronic contagious disease of the conjunctiva and cornea characterized by a subepithelial cellular infiltration, with a follicular distribution, the natural resolution of which is by cicatrization involving potentially much visual disability and gross deformity. It is one of the most important of our world-wide diseases, and because of the destructiveness of its sequelae and complications constitutes a serious problem from the economic, humanitarian, and public health standpoint.

From time immemorial it has existed in Asia as an endemic disease. Its spread in Europe has been closely related to various European wars. The name Egyptian ophthalmia relates to the historical fact that Napoleon's armies fell victim to an acute epidemic conjunctivitis which turned out to be trachoma, and with which his soldiers on their return to Europe infected the whole of that continent. It is believed that the stigmata of this disease are borne by as many as half the inhabitants of the globe. This high rate of incidence can be easily understood if one realizes that trachoma maintains a state of active inflammation of the conjunctiva for at least one year in the eyes of every patient affected, and when it finally heals, leaves scars which for the rest of the patient's life are recognizable as stigmata of trachoma. In Canada trachoma is unfortunately prevalent among the Indians and those associated with them, from Western Ontario through the prairie provinces

to British Columbia, and among them one finds many cases of impaired and destroyed vision due to this dread disease. Trachoma is communicated from man to man by direct, or almost direct, transfer of secretion or of follicle content. The virus of trachoma is filtered with difficulty, is of large particle size, and is seen in the form of elementary and initial bodies. This virus is transferable to monkeys and apes and is sensitive to sulfanilamide and related compounds. There is strict tissue affinity here.

Inclusion conjunctivitis appears in one of two well defined clinical forms—blennorrhœa as an acute papillary conjunctivitis in the new-born (inclusion blennorrhœa), or follicular conjunctivitis in the adult (swimming bath conjunctivitis). In the new-born infant the severity of the infection seems to vary considerably. Inclusions are found as a rule in great profusion in the epithelial cells. In the last 62 cases of ophthalmia neonatorum seen by the writer in the Montreal area, inclusions were found in no less than 42. In 25 cases the inclusions were found alone, in 17 others the infection was a mixed one and in this last group the gonococcus was present in 15. This form of conjunctivitis in the adult appears in one of two forms. In the papillary type the inflammation comes on with considerable fibrinous hypersecretion; inclusions are abundant and easily found. In the second or follicular type, there is a subacute onset with scanty secretion and follicular hypertrophy of the palpebral conjunctiva, especially of the lower lid. Involvement of the pre-auricular gland is common in both types.

Because of the constancy with which inclusion bodies, both intracellular and free are found in trachoma, and this form of conjunctivitis, their presence and meaning has for years aroused great interest. Halberstaedter and Prowazek⁶ in their original description of inclusion bodies of trachoma describe them as being made up of a bluish staining ground substance or matrix, which they called "plastin", and a mass of fine distinct reddish granules, which they termed "elementary bodies". They regarded the latter as the active agent of the disease. Many years later Lindner⁵ contested this interpretation of the blue substance, the matrix, and demonstrated that what appeared as an amorphous material in the dry fixed preparations, was actually a compact mass of well defined relatively large granular bodies. He called them "initial bodies". It is of interest to note that this type of morphological variation of the component bodies of the cytoplasmic inclusions of trachoma and inclusion conjunctivitis has been recognized also in another virus disease—psittacosis. The inclusion bodies, then, of these two diseases are composed of a matrix in which are found elementary and initial bodies. This disease is generally derived from an inclusion urethritis. The epidemiology is the same as in gonorrhœal

ophthalmia, except that transmission often occurs in swimming pools. This virus, filtered readily, is demonstrable in the form of elementary and initial bodies, and its inclusions are cytoplasmic and basophilic. It is localized to the epithelium of the conjunctiva, urethra, and cervix. This virus responds satisfactorily to the sulfonamide drugs. It may be that the venereal infection recognized abroad as Waelch or millet seed urethritis is the same condition as inclusion urethritis. The evidence marshalled by the authors includes among other things, a granular urethritis suggestive of trachoma, the presence of inclusion bodies, and prompt response to the sulfonamide therapy.

Modern work on the morphology of viruses has recognized that trachoma is a virus disease and that the H and P inclusion bodies are the primary infective agent. The virus theory of trachoma is founded on two important facts. First, that the H and P inclusion body morphologically bears a close resemblance to the inclusion body found in psittacosis, a virus disease, and, secondly, the infective agent of trachoma has been proved to be a filterable virus. The etiological significance of the elementary body in trachoma is well shown in the following experiment by Thygeson, Proctor and Richards.⁷

Epithelial scrapings from the trachomatous eyes of Indian children were found to contain Prowazek-Halberstaedter bodies. A preparation made from them was filtered through a collodion membrane. Part of the filtrate was cultured, part centrifuged, and part instilled into the conjunctival sac of a normal human eye. The culture media yielded no growth; the sediment after centrifugalization contained elementary bodies; and the eye of the human volunteer after five days incubation developed an acute inflammation which after six weeks was diagnosed as trachoma, the cornea showing characteristic changes. Elementary bodies were recovered from the conjunctival smears.

This experiment confirms the virus nature of the etiological nature of trachoma, inasmuch as elementary bodies were demonstrated in infective material; elementary bodies were seen in the centrifuge filtrate, and elementary bodies were present in large numbers in the experimentally produced disease. No other formed elements of possible etiological significance were demonstrated.

The most feasible explanation of the composition of the majority of inclusions is that elementary bodies first enter the cell, sometimes reaching the nucleus and then proliferate to form a column. The cell probably reacts and produces a covering which gives the inclusion a more or less homogeneous appearance. This is especially true in the trachoma group. This theory was advanced by Prowazek many years ago, who held that the inclusion body was formed from living organisms embedded in a matrix produced by the cell and he coined

the term "chlamydozoa" to express the idea of organisms being clothed by a mantle of cellular protoplasmic material. He also believed that the first sign of growth of the virus was the formation of the initial body, inside which, in turn, elementary bodies began to appear. This change, starting in the centre, gradually involved those situated peripherally, so that the whole cytoplasm became filled to the bursting point with elementary bodies, the nucleus being pushed to one side, ballooning, and degenerating, with later rupture of the cell. Certain inclusions are so constantly found in infectious diseases such as trachoma and inclusion blennorrhoea that they must be regarded as specific structures produced by the respective virus agent. The mere finding, however, of an inclusion in a cell does not indicate a virus infection. Inclusions must occur constantly in cases of the disease, and must be associated with the infectivity of the tissue in which they occur, before the possibility of virus infection can be considered; also the disappearance of the inclusion bodies during the recovery of the infection would help to prove some relationship of the inclusions to the tissue inflammation.

During the autumn of 1941 a severe epidemic of kerato-conjunctivitis, the superficial punctate keratitis of Fuchs, occurred in the region of San Francisco, mainly in ship-building plants. Hogan and Crawford⁸ recently reported on 125 of the 200 cases they had seen, and concluded after extensive bacteriological examination had proved negative, that the disease was probably caused by a virus.

The elementary bodies are of uniform size—about $0.25\ \mu$ in diameter, and stain a reddish blue with Giemsa's stain. They resemble in size and staining reaction the elementary bodies found in vaccinia, fowl-pox, and psittacosis. Phagocytosis of the elementary bodies by leucocytes is frequently seen. The initial bodies are cocco-bacillary in shape and vary from 0.3 to $0.8\ \mu$ in their greatest diameter. They are also Gram-negative and stain poorly with aniline dyes. With Giemsa's stain they are a blue colour. Division forms are frequent. They are identical in morphology and staining reaction with the initial bodies of trachoma.

Considerable difference of opinion has arisen regarding the interpretation of just what the different parts of the inclusion body actually mean. It is now believed by most workers that the initial body is the swollen form of the elementary body in its first three or four intracellular divisions. The morphological difference between the elementary and the initial body would then seem to be the normal difference between young and old forms. The virus of psittacosis has exactly the same type of morphological variation.

The virus etiology of inclusion conjunctivitis and trachoma seems to have been established, in-

asmuch as the inclusion bodies found in this inflammation are similar to those found in psittacosis and are of the same nature as those found in vaccinia, variola, and other recognized virus diseases. It arises by way of the genital tract of the mother, in whom the infection is, strictly-speaking, venereal in origin. Typical inclusions from the vagina and cervix of the mothers of infants with inclusion blennorrhœa have been frequently demonstrated, though the maternal condition is gynæcologically trivial.

The infectivity of bacteria-free filtrates has been shown to be dependent on the presence of the elementary bodies. That inclusion blennorrhœa is of virus etiology has been established by the filtration experiments of Gebb, Bottari, Thygeson and others. There can be little doubt that the inclusion is an actual phase of the infection. The heterogeneous structure of the inclusions suggests that the inclusion is not due to a degenerative change. Probably it is the diversity of the views regarding the make-up of the inclusion body that makes the study so attractive. Whatever their nature, there is no gainsaying their frequency in inclusion conjunctivitis. Also a fact of great importance is their presence both in animals and humans which have been infected with filtered material.

The cultivation of filterable viruses *in vitro* is indeed of prime importance, for many of the biological properties of viruses cannot be ascertained until this is accomplished. We shall not know what a virus actually is until this is done, nor shall we be able to explain fully the phenomenon of formation of inclusion bodies until then.

With regard to the treatment of trachoma, Sory gives the results of a recent study with sulfanilamide as follows: (a) Sulfanilamide only exceptionally arrests trachoma and by itself is less reliable than other accepted forms of treatment. (b) In conjunction with other therapeutic measures, recovery is accelerated and a high degree of efficacy is readily obtainable. Even in the latter instances recurrences may occur, suggesting that trachoma is, as formerly, arrested, and not cured.

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Men and Books

JABEZ HENRY ELLIOTT*

By F. Arnold Clarkson, M.B., F.R.C.P.(C)

Toronto

We have gathered here this evening to do honour to one of our Fellows whose contributions to the Academy and particularly to the library have been outstanding. It was not in the urn of unrelenting fate that he should be spared to add to his long vista of generous service, but we shall have reason to remember him for many years when we realize what he did in the three decades he worked on the Library Committee.

In other days it was the custom to have the heralds precede the catafalque and proclaim with fanfare of trumpets, the glorious deeds of their departed hero. We have already performed a similar ritual in our modern way and our archives now contain the many and affectionate tributes which appeared in the journals, together with the record of his contributions to medical science. It is not necessary therefore to recall all that was accomplished by our beloved colleague, testifying to his tireless zeal, his public spirit and his sedulous activity for the good of men.

Dr. Jabez Henry Elliott graduated from the University of Toronto in 1897 with honours, the gold medal, and the George Brown Scholarship, which gave him a year's postgraduate course in physiology. He then became superintendent of the Muskoka Cottage Sanatorium, the first of these institutions in Canada. Later, on a year's leave of absence, he spent part of his time in the clinical study of tuberculosis, and part in West Africa on malarial research. On his return he was placed in charge of the Muskoka Free Sanatorium at Gravenhurst, and his life work really began.

In the beginning of this century, the trend of medicine was towards the open spaces. There had been apostles crying in the wilderness, but few took heed of them. As far back as 1772 Lettsom wrote on the effects of "stuffy air". In the middle of the nineteenth century, Sir William MacCormac was a most vigorous exponent of fresh air for tuberculosis. When his Belfast patients refused to keep their windows open, after he had so ordered, he broke the glass with his cane. But the great majority of the laity, who usually lag ten years behind the profession, still dreaded the "night air" and thought that anyone sleeping with an open window in winter, was mildly insane. The campaign for a rational treatment of consumption had to overcome mass ignorance, *laissez*

*An address delivered on the occasion of the unveiling of a plaque to the late Dr. Jabez Elliott in the Academy of Medicine, Toronto, on January 11, 1944.

faire, and apathy. This was the period of the workman's twelve-hour day, of child labour and slums, and of "raw" milk dipped from a can. An eminent English surgeon, Lawson Tait, had just died, firm in the belief that antiseptics was a myth. An Ontario medical health officer had proclaimed his lack of faith in diphtheria antitoxin. Many practitioners doubted the lethal power of the little red rods they

service of the afflicted, and the public began to realize that this new gospel was not just another vain hope, to prove again a yeasty dream. Anti-tuberculosis societies were organized, milk was pasteurized, and popular imagination was so stirred that the actual suffering human faces could be visualized, the agonies and slow crucifixions of human beings like ourselves. In all this Dr. Elliott had an important part, awaken-



The plaque was made by Lieutenant Cleeve Horne, O.S.A. and was unveiled in the Academy of Medicine, Toronto, by Mrs. Charles Holmes, January 11, 1944.

were shown under the microscope at their medical societies. Even the dead hand of a superstitious pharmacopœia was laid on the medical student, for he was sometimes taught that creosote was more beneficial than fresh air. And the mortality from consumption was 100 per 100,000 living—one funeral in every seven. And there was *one* sanatorium. "When vision fails, the people perish."

In the next twenty years the front line was manned by devoted workers, dedicated to the

ing philanthropy, throwing incense upon the altar and provoking a brighter flame. Nineteen twenty and the death rate 78.8—one funeral in fourteen; sanatoriums, eight.

The next two decades stressed the prevention of the disease. "To heal a sick man of the generation before last is something. To make this world a cleaner place for the children of yesterday, today and tomorrow is everything." "Hunt for the tubercle bacillus among persons who are not yet ill". And so the campaign for

mass x-ray examinations has revealed some startling results, and already living has become a great joy again for hundreds in our own province.

But there is no use preaching prevention to a man who has had no breakfast. We must talk also of housing and nutrition, and help the families of those struck down, and so we now have home-makers, dietitians and allowances.

Forty years have passed. Prevention has become a public conviction. The mortality in Ontario is 26.8 and we have ceased to reckon the funerals, for tuberculosis is no longer the "Captain of all the men of death." Sanatoriums 13. Accomplished very largely by the courage and energy of the few, the campaign was a success, palpable even to the world's coarse thumb and finger.

By both training and predilection Dr. Elliott's interest in medicine was confined largely to diseases of the chest, although he was one of the few specialists in tuberculosis who never had the disease himself. There is always some mystery in the way certain men refresh their patients with their presence. This he had to an eminent degree. He brought with him to the sick bed a wholesome compassion, flavoured with a good natured appreciation of the absurdities and incongruities of life, all of which helped many a poor sufferer up the steep slopes of Calvary. One of the tragic episodes in his life was to have his best-beloved professor in the faculty of medicine die in his arms at the sanatorium, not however from tuberculosis.

There were other facets to his life not so well known to his colleagues, which had much to do in breaking the monotony of hospital wards and lecture rooms. When he was a boy he roamed the woods, learning to read with love the manuscript of nature, and thus formed associations which were a constant and enduring delight. He found his *æquanimitas* as the white-throat whistled the exhortation of the dawn and the hermit thrush pronounced his plaintive requiem at twilight. Well he knew the swamps in spring that pipe with tender batrachian song, where the trilliums make white constellations among the old stumps. If you were of the elect and had the secret password, he would lead you to a fairy land of flowers, where grew masses of pink ladyslippers, the queen of orchids. And as you walked with him in green pastures beside the still waters, you felt, as Montaigne said, "the rare delight of dividing your life between the solace afforded by nature and the stimulus received from man". It was thus that he swept away from his mind all things connected with his profession and was able to start next morning fresh for vigorous work.

These amateur interests with which a man fills in his spare half hours have often as much to do with the formation of character as the more serious business of making a living. The amateur often gains a more sincere appreciation

of the sciences than a man who spends his life studying them. Moreover, in the pleasure of pursuit of any hobby he rids himself of a superficial omniscience and puts on a flexible armour of doubt, when too many people are certain. Why should a man look at the world through only one knot-hole?

Dr. Elliott tabulated the results of some of his rambles under the title "The Trees and Shrubs of Muskoka" which was so complete that little has been added to it in forty years. He also made records of some rare flowers, one, an aster not found previously so far north. In examining the blood of crows and some other wild birds in Muskoka, he discovered a species of filaria. These observations, together with his work on malaria, while in West Africa, were a repayment for the health and contentment, attained when, like Antæus, he touched again his mother Earth.

But another and intensive hobby, and our chief interest at this moment, was his work on the Library Committee, which he began in 1912. No doubt his natural love of books was heightened in his postgraduate course at Johns Hopkins, where as he assisted Sir William Osler in the arrangement of his famous collection, the seed was dropped that dominated the rest of his life. The Academy soon recognized that this new member was a real Caliph in the book world. Before long they had evidence of his acumen in finding rare editions, and in searching out some of the Fellows who could be persuaded to purchase them for us. And thus, in a few years and largely by his efforts, we had on our shelves a creditable number of old and valuable books, the classics of medicine, which, though seldom used, provide material for research. Perhaps the best example of this is an almost complete collection of all the editions of Laennec in English, with a sprinkling in other languages; altogether 81 books.

No other of our Fellows had such a nose for these bibliophiles' treasures. In his extended flights to foreign lands he went by instinct to an obscure street in a little known city (like Zagreb) and found in the aboriginal, earthy odour of a bookshop, some old man, with a parchment face, a black skull cap and a waistcoat not without historical reference to former meals. Or it might be in the bookstalls on the banks of the Seine, or in Barcelona, or Madrid. These unpromising looking gentlemen are really scholars who greet him as a friend, and before long are dragging down from cobwebby shelves, prizes which cause bulging eyes. Soon they are transferred to our fisher of books, and follow him back home in large boxes, to be exhibited with many a chuckle to the Library Committee.

Very often the hunt after the works of a certain author arouses an interest in another. Thus in gathering the Laennec collection, Dr. Elliott found that Forbes had translated the original French edition into English. This led

to further research and we have now several volumes of Forbes' writings. In many of the books there were pencilled notes on the margins, by some forgotten hand, which again could start a hunt, for there is no excitement like the uncovering of new information.

But after all, though a bibliophile despises nothing relating to a book, either the contents or the making, the important thing is the contents. "A book is a thing to be read and not enclosed in a glass case, exhibited like a rare humming-bird for stupid spectators to gaze at." Books are true levellers, the monuments of vanished minds, and like proverbs, receive their chief value from the stamp and esteem of the ages through which they have passed.

When Dr. Elliott reported to Council on the condition of the Library in 1915 we had 7,000 volumes. Today we have more than 31,000. He mentioned in that report that we had no incunabula. Shortly after, Sir William Osler sent us our only one. In his presidential address in 1924, which was well sprinkled with Attic salt, he said "The Academy should be the repository of everything relating to the history of Medicine in Toronto and Ontario". We have now many contributions of this kind in our possession, several of them by Dr. Elliott himself. In that same address he suggested bequests by will to the Academy, and we have reason to be grateful that he practised what he preached.

Those of us who were privileged to work with him found him a potent ferment, with an eager enthusiasm which energized a high quality of mind. The breadth and accuracy of his knowledge of our own library, and his remarkable memory of the books acquired, together with their contents, were a matter of continual admiration and envy. He had a most important part in making our library what it is now, a sanctuary where the silver of the printed word may be transmuted into the gold of contemplation. We can write over our doorway, as they did in the library at Thebes—"Medicine for the Soul".

Out of all this infection with the germ of the bibliophile grew a knowledge of the history of our profession which the university recognized by appointing him in 1931 to the chair of the History of Medicine. He began at once to bring his department up to modern standards and by seminars and visits with the students to our library and others, he made a laboratory course, as far as was possible in such a subject. He always believed that history not only gratified the reader's curiosity about the past but modified his view of the present and his forecast of the future. The results of his teaching will be seen in the next decade, when some of his students will make their contributions to our journals.

What he did for us in the Academy he repeated in the Military Institute, for he brought

their library up to such efficiency that it is one of the best of its kind in the Dominion.

Tonight we are paying tribute to our generous friend, now dust in earth's keeping, with this bronze plaque, which we shall place in our Valhalla. But at the present time, in Sir Thomas More's phrase, the world is ruffled and fallen into a wilderness. Some day, (may it be soon!) the earnest longing of the son of Amos shall come to pass, that nation shall not lift up sword against nation, neither shall they learn war any more. Then lamps which have long gone out will be lit again and we shall have a new and larger home for the Academy, with a fitting place where this and other tablets will honour the names of our distinguished fellows. Dr. Elliott had all the honours that were within the gift of our profession but he showed little devotion to the bric-a-brac of life, much preferring its simplicities. We shall look back and gratefully remember that for us it was a high privilege to have been associated with one who combined with medical erudition that intelligence of the heart which is the essence of a great personality; one who looked at life steadily and saw it whole. The angel might write him down as one who loved his fellow men. His untiring devotion to others suggests the words of the father of Latin poetry, "When they ask for advice, he kindly points the way, and lights their lamps from his."

421 Bloor St. W.

CATECHISM IN MEDICAL HISTORY

By Heber C. Jamieson, M.B., F.R.C.P.(C)

Edmonton

QUESTIONS

1. How were surgeons regarded by the Universities of Oxford and Cambridge in the fourteenth century?
2. Where in the Bible is a passage which is supposed to be a dig at the physician?
3. What system of Medicine of the eighteenth century, and still practised, was based on a personal experiment?

ANSWERS

1. Neither of these Universities looked with favour on surgeons and although licentiates in Surgery as well as Medicine were created before the sixteenth century, only the latter could proceed to the degree.
2. In 2 Chronicles 16, 12-13. Asa "in his disease sought not the Lord, but to the physicians. And Asa slept with his fathers."
3. Homœopathy (homoios = like; pathos = suffering). In a day when cinchona bark was used as a cure for Ague (Malaria) Hahnemann (1755-1843) took a large dose and experienced rigors similar to those of Malaria. From this experience he concluded that "like cured like", or as he put it, "Similia similibus curantur".

Association Notes

PRELIMINARY PROGRAM

SEVENTY-FIFTH ANNUAL MEETING

of the

Canadian Medical Association

TO BE HELD IN THE ROYAL YORK HOTEL, TORONTO,

MAY 22, 23, 24, 25, 26, 1944

<i>President</i>	-	-	-	-	DR. D. SCLATER LEWIS, Montreal
<i>President-Elect</i>	-	-	-	-	DR. HARRIS MCPHEDRAN, Toronto
<i>General Secretary</i>	-	-	-	-	DR. T. C. ROUTLEY, Toronto
<i>Chairman, Central Program Committee</i>	-	-	-	-	DR. DUNCAN GRAHAM, Toronto

Arrangements for the Seventy-fifth Annual Meeting of the Association to be held in Toronto during the week of May 22, 1944, are progressing satisfactorily.

General Council will meet on Monday and Tuesday, May 22 and 23.

On Tuesday evening General Council will be dinner guests of the Ontario Division.

A very attractive series of Round Table Conferences has been arranged for Wednesday and Thursday morning, from nine to ten o'clock, to be followed by General Sessions on these two mornings.

Sectional Meetings will be held on Wednesday and Thursday afternoons.

The General Session of Friday morning has been given over to a discussion on health insurance and allied problems.

The Ontario Division of the Canadian Medical Association will hold its annual meeting on the afternoon of Friday, May 26, continuing on Saturday, May 27, until the business has been completed.

Reservations may now be made at the Royal York Hotel. Be sure to indicate the type of accommodation desired and definite time of arrival.

Central Program Committee

The Central Program Committee which is responsible for the scientific program is as follows:

Dr. Duncan Graham (*Chairman*)
Dr. Alan Brown
Dr. H. K. Detweiler
Dr. H. A. Dixon
Dr. Roscoe Graham
Dr. J. C. McClelland
Dr. Alexander E. MacDonald
Dr. Harris McPhedran
Dr. William Scott
Dr. H. J. Shields
Dr. A. C. Singleton
Dr. D. E. S. Wishart
Dr. George S. Young
Dr. T. C. Routley
Dr. Harvey Agnew.

PROGRAM

At time of going to press the following have accepted invitations to take part in the program.

ROUND TABLE CONFERENCES

Anæsthesia

Factors leading to fatalities under inhalation anæsthesia

Dr. H. J. Shields, Toronto (*Chairman*)
Surg.-Lieut. Digby Leigh, R.C.N.V.R.,
Montreal
Dr. C. H. Robson, Toronto.

Factors leading to fatalities under spinal anæsthesia

Dr. W. E. Brown, Toronto (*Chairman*)
Dr. Ralph Hargrave, Toronto
Dr. D. C. Aikenhead, Winnipeg.

Dermatology

Diagnosis and treatment of seborrhœic-dermatitis

- Dr. E. J. Trow, Toronto (*Chairman*)
Dr. F. S. Lazenby, Toronto
Dr. G. S. Williamson, Ottawa.

Dermatology and Radiology

The treatment of plantar warts

- Dr. H. A. Dixon, Toronto (*Chairman*)
Dr. E. J. Trow, Toronto
Dr. W. C. Kruger, Toronto.

Medicine, Obstetrics and Gynæcology

Heart disease and pregnancy

- Dr. John Hepburn, Toronto (*Chairman*)
Dr. Nelson Henderson, Toronto
Dr. Carlyle Hamilton, Toronto.

Medicine and Surgery

Diagnosis and treatment of carcinoma of the stomach and colon

- Dr. Roscoe Graham, Toronto (*Chairman*)
Dr. E. E. Cleaver, Toronto
Dr. A. S. Singleton, Toronto
Dr. Joseph Daly, Toronto.

Obstetrics and Gynæcology

Diagnosis and treatment of uterine cancer

- Dr. W. G. Cosbie, Toronto (*Chairman*)
Surg.-Lieut. Commander J. R. McArthur, Halifax
Dr. G. E. Richards, Toronto.

Heart disease and pregnancy

(Combined conference with Medicine, see above).

Ophthalmology

Plastic surgery of the eye

- Dr. Walter W. Wright, Toronto (*Chairman*)
Dr. Lloyd Morgan, Toronto.

Otolaryngology

Head colds

- Dr. D. E. S. Wishart, Toronto (*Chairman*)
Dr. A. A. Campbell, Toronto
Wing Commander R. F. Farquharson, R.C.A.F., Toronto.

Pædiatrics

Maternal feeding

- Dr. J. H. Ebbs, Toronto (*Chairman*)
Dr. William Dafoe, Toronto
Dr. C. E. Snelling, Toronto.

Chemotherapy in children

- Dr. Nelles Silverthorne, Toronto (*Chairman*)
Dr. J. L. McDonald, Toronto
Dr. Alan Brown, Toronto.

Radiology

Chest lesions following general surgical procedures.

- Dr. W. J. Cryderman, Toronto (*Chairman*)
Dr. M. M. R. Hall, Toronto
Dr. A. R. McGee, Toronto.

Surgery

Burns

- Wing Commander A. W. Farmer, R.C.A.F., Toronto (*Chairman*)
Dr. Douglas Ackman, Montreal
Dr. R. M. Wansbrough, Toronto.

Urology

Carcinoma of the prostate

- Dr. N. W. Roome, Toronto (*Chairman*)
Dr. R. J. McComb, Toronto
Dr. Ross Flett, Toronto.

GENERAL SESSIONS

The President's Valedictory Address

- Dr. D. Selater Lewis, Montreal.

The management of pre-eclampsia

- Dr. N. J. Eastman, Baltimore.

Medical care of the industrial worker

- Dr. R. B. Robson, Windsor.

The management of breast tumours

- Dr. Roy D. McClure, Detroit.

SECTIONAL MEETINGS

Anæsthesia

Anæsthesia in the aged

- Surg.-Lieut. E. H. Watts, R.C.N.V.R., Edmonton.

Endotracheal anæsthesia in children

- Dr. C. H. Robson, Toronto.

The use of curare in anæsthesia

- Dr. Harold Griffith, Montreal.

Pentothal anæsthesia

- Dr. Kenneth Heard, Toronto.

Anæsthesia—Continued

The sequelæ of spinal anæsthesia

Dr. D. C. Aikenhead, Winnipeg.

Anæsthesia as practised on active service in the Navy

Surg.-Lieut. Commander Carl Stoddard,
R.C.N.V.R., Halifax.

The modified Leech technique of cyclopropane administration

Dr. J. E. Murphy, Regina.

The use of pentothal sodium in an army anæsthesia service

Major George Boddington, Camp Borden.

Dermatology

Generalizing eruptions, "ids", following treatment of the skin

Dr. E. J. Trow, Toronto.

Eruptions of the skin due to drugs, with special reference to the sulfa group

Dr. J. F. Burgess, Montreal.

The treatment of scabies and other animal parasitic diseases of the skin—a wartime problem

Dr. Harold Orr, Edmonton.

Medicine

Indications for shock therapy in mental illness

Dr. L. D. Proctor, Toronto

Primary atypical pneumonia

Colonel W. P. Warner, R.C.A.M.C., Ottawa.

Psychoneuroses in the army overseas

Dr. H. H. Hyland, Toronto.

Medical treatment of gastric hæmorrhage

Dr. C. J. Tidmarsh, Montreal.

The menace of tropical diseases in Canada

Dr. F. B. Bowman, Hamilton.

Gastro-intestinal symptoms in cardiac disease

Dr. J. W. Scott, Edmonton.

Obstetrics and Gynæcology

Some varieties of uterine rupture

Dr. N. J. Eastman, Baltimore.

The importance of blood studies in the obstetrical patient

Dr. N. W. Philpott, Montreal.

Obstetrics and Gynæcology—Continued

The physiology and treatment of the menopause

Dr. J. S. Henry, Montreal.

Pelvic endometriosis

Dr. Donald M. Low, Toronto.

Ophthalmology

Cataract operation following trephine

Dr. J. F. A. Johnston, Toronto.

The value of orthoptics in the treatment of strabismus

Dr. Lloyd Morgan, Toronto.

Problems in x-ray localization

Dr. J. A. MacMillan, Montreal.

Changes in the fields of vision in syphilis

Dr. Stuart Ramsey, Montreal.

Otolaryngology

Carcinoma of the larynx

Dr. D. H. Ballon, Montreal.

Menière's disease with some observations on its treatment with histamine

Dr. A. A. Campbell, Toronto.

Otolaryngological problems in war service

Dr. H. W. D. McCart, Toronto.

Subject to be announced

Dr. G. E. Hodge, Montreal.

Pædiatrics

The management and prevention of rheumatism

Dr. R. R. Struthers, Montreal.

The hypothyroid child

Dr. Howard Spohn, Vancouver.

The prevention, treatment and end results of meningitis

Dr. Nelles Silverthorne, Toronto.

Subject to be announced

Dr. Graham Ross, Montreal.

Practical methods of supplying the essential vitamins of childhood

Dr. Elizabeth Chant Robertson, Toronto.

Allergic manifestations of the newborn period

Dr. George A. Campbell, Ottawa.

The prevention and treatment of coeliac disease

Dr. J. H. Ebbs, Toronto.

Radiology

Osteogenic sarcoma developing on Paget's disease of bone

Dr. Ronald Burr, Kingston.

Dyschondroplasia and some allied conditions

Dr. A. H. Rolph, Toronto.

The rôle of the radiologist in the management of fractures

Dr. W. C. Kruger, Toronto.

Radiological survey of the incidence of pulmonary tuberculosis in the Royal Canadian Navy from 1939 to 1943

Surg.-Lieut. Commander G. Jarry,
R.C.N.V.R., Ottawa.

Some phases of military radiology

Major R. W. Boyd, R.C.A.M.C., Ottawa.

X-ray aid in the differentiation of functional from structural changes in the gastrointestinal tract

Dr. W. M. Gilmore, Stratford.

Radiological findings in lesser sac effusions

Dr. M. C. Morrison, London.

Subject to be announced

Dr. G. G. Stoddard, Ottawa.

Surgery

Fractures of the wrist and hand

Surgeon Commander H. S. Morton,
R.C.N.V.R., Esquimalt.

End results of removal of internal semi-lunar cartilage in personnel of the Air Force

Dr. Murray Meekison, Vancouver.

Avulsed skin as a whole-thickness graft

Wing Commander A. W. Farmer, R.C.A.F.,
Toronto.

The abuse of iodine in hyperthyroidism

Dr. R. R. Fitzgerald, Montreal.

Carcinoma of the stomach

Dr. P. H. T. Thorlakson, Winnipeg.

Surgery—Continued

Postoperative survival periods in gastro-intestinal carcinomata

Dr. Lyon H. Appleby, Vancouver.

Pyloric stenosis with alkalosis in gastric tetany

Dr. Jessie Gray, Toronto.

Experiences with intravenous pectin solution in the prevention of shock.

Dr. Roy D. McClure, Detroit.

Urology

Subject to be announced

Dr. E. R. Hall, Vancouver.

Renal calculi in the recumbent patient

Dr. K. F. Davis, Weston.

Unusual secondary testicular growth in the lung

Dr. C. A. Chisholm, Toronto.

A survey of urology in a military General Hospital

Captain D. A. Duckworth, R.C.A.M.C.,
Toronto.

A Müllerian duct cyst in a male

Dr. Emerson Smith, Montreal

Dr. Alex. Strasberg, Montreal.

ANNUAL MEETING OF THE ONTARIO DIVISION

Royal York Hotel — May 26 and 27
Toronto

Friday, May 26

2.00 p.m. Meeting of Council

8.00 p.m. Meeting of Council

Saturday, May 27

9.30 a.m. Meeting of Council

1.00 p.m. Annual Business Luncheon



The General Secretary's Page

Without an appointment and unannounced, a man walked into my office one day. Before I had time to ask his name or business, he said, "Tell me, is there an honest to goodness general practitioner in this town?" As I studied my caller, he continued, "I was moved to Toronto six months ago. I have a wife and four children. We have picked up quite a variety of diseases since we came here and I have already employed and paid eight doctors. In my old home town, I would have paid one." While he stopped for breath, I said, "Yes, there are more than 1,000 practitioners in this city and as far as I know, they are all honest and well-qualified. But, aside from your opening question, what brought you here?" "Well, simply this," he replied, "I had heard about the Canadian Medical Association and it occurred to me that this was the proper place for me to come for advice. Surely you can tell me the name of an all-round medical doctor who will be willing to take on my family and give us all the medical care we require. I don't object to paying my honest debts but I'm fed up contributing to a number of doctors each one of whom seems to confine his knowledge and his practice to a small fraction of the human body."

That this man was in deadly earnest, one could plainly see. He felt that an intolerable situation had engulfed him during the past few months and something had to be done about it.

It looked to me like a case that required careful handling. "Tell me," I began, "if I am not intruding into your private affairs, something about this bad luck you have been having with illness in your family."

"Well, to begin with," he said, "we were only here three weeks when John, my boy, he's ten, came down sick with a sore throat and a high fever. By night he was burning up and complaining of pains in his back and legs, too. I didn't know any doctor so I called the nearest man whose name I had noticed over the door around the corner. I must say I was impressed with his thoroughness. After carefully examining the lad, he took some throat swabs and some blood, telephoned the druggist for medicine and went away. Next day, two other doctors were brought in, one to look at the throat and another who I learned later was a child specialist. Well, to make a long story short, there were five doctors on that case during the next two weeks. It seems they were afraid of brain fever or some kind of paralysis, but fortunately, everything turned out all right. They shot some stuff into John's blood and gave him various medicines and I am glad to say the boy was back to school in a month's time."

This seemed like a good place for me to break in again. "May I ask you what that bout cost

you?" "Certainly," he replied, "it cost me \$90.00."

"Do you think you were overcharged?"

"Well, it cost plenty; more than one doctor would have charged, I imagine. The question in my mind is, why did I need so many doctors?"

As carefully as I could I explained the situation. Here was a case of illness that might be very serious, if not fatal. The doctor whom he called was taking no chances. He knew that his colleagues who specialized in certain fields could assist him in making a diagnosis and in prescribing the proper treatment. Obviously, the net result was a fairly quick conquest of a serious threat at a cost which the father did not consider to be inordinately high. I went on to explain that the old carriage maker could make a buggy all by himself but the high-powered motor vehicle required many expert hands to produce and care for it and the human body was the most intricate and wonderful piece of mechanism known to man. I took pains to emphasize that specialization in medicine is a gradual and inevitable sequence to an ever-widening horizon of medical knowledge and discovery and no one man, no matter how brilliant or clever could begin to comprehend and apply all of this knowledge in the treatment of the sick. His boy was well because he had been fortunate to receive adequate medical care. At last my caller said, "Well, I hadn't thought of it that way. Maybe you are right."

If there be any moral in this episode, it is this,—the general public or at least a great portion of it, has not a clear conception of the strides medicine has made in the past few years. Practising physicians might well make it a part of their business to explain these developments to their patients and what their practical application means in the saving of lives. This would result in better public understanding and appreciation of the profession and its *modus operandi*.

According to a law introduced in April, 1942, everyone in Norway who has reached the age of 15 years must have his lungs examined by screen photography when the authorities demand it. Persons exempt from this obligation are those who have been x-rayed at school or who are notified cases of pulmonary tuberculosis and have been x-rayed within twelve months of the time they reach the age of 15. When the examination has been completed, information to this effect is stamped on the person's identity card.—*Tidsskrift for Norges Laegeforebund*, July 1, 1942, No. 13. (From *Brit. M. J.*)

Divisions of the Association

Saskatchewan Division

The College of Physicians and Surgeons of Saskatchewan has issued the following Bulletin through its Central Health Insurance Committee.

There has been a feeling abroad in the profession, that the profession as well as its Committee on Health Insurance, is very slow in its work and in accomplishing much in a concrete and positive way. It has been said that it is impossible to ascertain the feeling of the profession and acquire the unity needed, until a plan is presented to the profession and they have an opportunity to decide one way or the other.

While at first sight this may appear to be so, nevertheless the question of Health Insurance and bringing it or a similar plan into operation, is of such a magnitude and so important, that were the profession to make a false step or adopt a wrong attitude either in matters of procedure or policy, irreparable harm might be done.

Your Committee was finally set up, and was faced with several problems in this connection.

1. A Health Insurance Act was drafted and proposed for study to a Special Committee of the Government, and this Committee is intended to bring this Act in the main to Parliament.

Your Committee reviewed this Act section by section in the first instance, and while there were objectionable features in it, the Committee considered it as poor policy to condemn it and reject it as a basis for working out the problem.

In this connection Dr. Routley has said, that Health Insurance acceptable to the profession, can be worked out within the framework of this proposed Draft Act.

2. The Committee has neither knowledge nor training for the drafting of legislation, and could not replace the Draft Act proposed.
3. The Committee found that before any definite plan or decision could be made and suggested to the profession, certain fundamental principles would have to be ironed out and accepted. Until the preliminaries were agreed upon, no progress could be possible on questions of detail in the Act.

The Committee, cognizant of the official stand taken by the Canadian Medical Association and the College of Physicians and Surgeons in Saskatchewan on Health Insurance—approving it in principle conditioned upon, firstly, the standards of medicine being maintained or raised, and secondly, the dignity, liberty and welfare of the profession itself not being impaired—did not want to do harm to the relationship between the profession and Government

authorities. Also, the Committee did not want to commit the profession to something from which it would have to retract. Also, the Committee did not want to propose something which no Government could accept, having regard to a number of factors which will enter into the Government decision.

Thus it was, that the Committee at the Convention last September, laid down for your approval the fundamental principles which must be observed under any scheme of Health Insurance.

Since then, your Committee has studied every phase of the problem which the time and energy of the members permitted, and on Sunday, January 30, 1944, the whole Committee met for a full day session at Regina.

That session, reviewing its past studies, found that except on two points, the proposed Draft Act can be acceptable to the profession as a whole. The Act is sufficiently wide in its terms and general in its sections, that it can be interpreted quite favourably to the profession, save only on the matter of representation and control of medical matters.

This and other points are being dealt with under separate heads in this, and following bulletins.

The personnel of the Health Insurance Committee of the College of Physicians and Surgeons is as follows:

Dr. U. J. Gareau,	Dr. D. P. Miller
<i>Chairman</i>	Dr. C. J. Houston
Dr. J. L. Brown	Dr. J. J. Hamelin
Dr. C. R. May	Dr. R. G. Ferguson
Dr. C. S. McLean	Dr. M. H. McDonald
Dr. G. J. McMurtry	Dr. E. W. Kirkby
Lt.-Col. James Miller	Dr. O. M. Irwin
Dr. Geo. Walton	Dr. A. C. Scott
Dr. J. A. Bloomer	Dr. J. A. Valens
Dr. R. K. Johnston	Dr. A. W. Argue
Dr. J. F. C. Anderson	

THE DRAFT ACT AND THE DOCTOR

In its present form, the Draft Act gives final and absolute control of all matters, including strictly medical matters, to the Health Insurance Commission. The Commission will obviously have a majority of non-medical members, and the danger exists that the profession may be jettisoned.

On the other hand, one can hardly expect that Government would be a party to the destruction of medicine or the profession. The Act is general enough in its terms to admit of interpretation favourable to the profession, and it would appear to be particularly poor policy and procedure to condemn the Act in its entirety on this account. The Committee rather feels, that a spirit of conciliation and co-operation would be more likely to result in our interests being protected, even under the Act.

For that reason, instead of ruling out Sections 35 and its ancillaries, as well as 45, the Committee propose that the Commission remain

as it is, but the appointment of the Chairman shall have the approval of the College of Physicians and Surgeons his 10 years of office shall be 5 years, his retirement age 65, and his remuneration "adequate".

So far as 45 is concerned, which deals with the Representative Committee, here our Committee says, that the Commission "SHALL" recognize instead of "may" recognize a Medical Advisory Board, and shall include "the medical profession" under Subsection (4), making it incumbent on the Commission to recognize the specially appointed Medical Advisory Board of our profession, in accordance with Subsection (3).

This can work out well enough for the profession, as long as the profession is well united and from within itself gives to its Medical Advisory Board, ample powers.

In that way, it is hoped that the strength of the Medical Advisory Board and reasonable presentation of the professional position in medical matters, will result in the Health Insurance Commission not violating our rights, our liberty, or our wellbeing.

Another point under the Act which has given our Committee some concern, is, where will private practice and the public health program conflict, or, where will the line be drawn where private practice gives up the field for the public health program, or the reverse? In what fields will compromise and co-operation best be served by one or the other, to the exclusion of the other? This matter is being dealt with by a special committee, on which Dr. Walton, representing the public health group, will act.

A third element in the Act which affects the medical profession directly, is that of remuneration. The Act provides that capitation, salary, or fee may be adopted. And once the profession has taken a stand on this question, it is felt that the Commission will honour that stand. So far as the Act is concerned, no change can be suggested without doing more harm than good.

A number of dangerous items are such as:

1. Classification of medical practitioner;
2. The question of whether members of the College shall individually or collectively participate in the Plan, or refrain from doing so;
3. The manner and quantum of remuneration;
4. Clinical and centralized practice;
5. Referees and taxing functions;
6. Investigation and disciplinary powers;
7. The keeping of records;
8. Contacting practitioners with a view to continually raising the standards of medicine and its service;
9. The placing of practitioners where needed, and determining their competence and fields of service [Section 28, subsection (4)].

On these and kindred points there is little doubt but that the Commission will yield to the Medical Advisory Board, if this Board shows the proper knowledge and strength to handle the problems, and if it has the backing of the profession.

DOCTORS' REMUNERATION

A great deal has been said about doctors' remuneration, and in one of our earlier Bulletins we gave an analysis of the pros and cons on capitation. The profession itself, while it appears to be in favour of the fee-for-service basis, has nevertheless not yet taken a definite stand on the question. At the Convention last summer, the following Resolution was submitted:

- "1. RESOLVED that under any form of health scheme in Saskatchewan, the medical practitioners receive payment for all services rendered, such payment to be on the basis of a schedule of fees so revised that under all the circumstances a fair remuneration is provided for work done;

Provided that where local conditions are such that it makes this method of payment undesirable to the medical practitioner involved he shall have the right to a salary contract arrangement set up by the Council for the College of Physicians and Surgeons and the Health Insurance Commission.

- "2. WHEREAS under the capitation system of payment, the remuneration has no relation to and is not measured by the actual work done or services rendered;

THEREFORE BE IT RESOLVED that the capitation system of payment be eliminated entirely from any health scheme in Saskatchewan."

The Convention refused to deal with the Resolution, and turned it back to the Committee for further study. When the whole committee met on January 30, the question was up for prolonged discussion. The committee disagreed, and has now asked a special committee to handle the question and report back at our next meeting. Dr. Valens is the chairman of this committee, and if you have any view on the subject, you should place them before his Committee so that their deliberations may be all embracing as possible, in order that their report will embody conclusions acceptable to the entire profession.

PUBLICITY

For some time now in certain sources, a good deal of abuse has been directed against the medical profession. Generally, it is below the dignity of the profession to reply to such slanders, but medicine is facing a crisis, and it ill-behooves medical men at a time like this to permit the public to acquire wrong impressions and false ideas. We all know, that individually, the doctor is everyone's friend, but as a group we are regarded as anything but that.

The whole health committee has felt that systematic attacks should be repulsed, and set up a committee under the chairmanship of Dr. J. F. C. Anderson of Saskatoon, to handle publicity generally, with part of its functions this very work. Dr. Anderson, in replying to J. H. Cumming recently, set a high standard along this line. Dr. Anderson's answer in the *Star-Phoenix* on January 7, was a commendable piece of work, and it is hoped that every member of the profession will bring to the attention of his Committee, anything that warrants action along this line.

Medical Societies

La société médicale des hôpitaux universitaires de Québec

A l'Université Laval, vendredi le 3 décembre 1943, à 8 h. 30 du soir. Séance consacrée à l'étude des anémies.

SYMPTOMATOLOGIE.—Docteur Renaud Lemieux.

L'auteur a été chargé de faire une revue d'ensemble de la symptomatologie des anémies.

Les développements qui sont survenus depuis quinze ans dans le traitement des anémies ont contribué à modifier certains aspects pathogéniques et cliniques des anémies en général. De nombreux travaux et des classements nouveaux ont été faits qui nous semblent pas jeter de très grandes clartés sur ce chapitre qui est encore à l'étude. Les classifications anciennes permettent une compréhension plus facile des anémies.

L'auteur divise son travail en trois parties; la première partie qui a trait aux anémies hypochromes; la deuxième partie qui traite des états intermédiaires et une troisième partie qui comprend les anémies pernicieuses, les anémies hyperchromes et les anémies aplastiques.

Chacune des grandes divisions de cette présentation résume et condense certains aperçus cliniques et hématologiques des anémies, sans cependant entrer dans les généralités et les détails qui sont de notion courante.

ESSAI DE CLASSIFICATION PATHOGÉNIQUE ET HÉMATOLOGIQUE.—Docteur Louis Berger.

En se basant sur le fait que dans les conditions normales il y a un équilibre parfait entre la moëlle osseuse et le sang circulant, qui forment ensemble une unité fonctionnelle, l'auteur propose de distinguer entre anémies par déficit hématopoïétique et par excès de destruction. Ces deux mécanismes pathogéniques ne sont pas toujours indépendants l'un de l'autre, mais jouent, suivant le cas, un rôle primitif ou prépondérant. Les anémies par déficit médullaire peuvent être subdivisées en variétés hypochrome, hyperchrome et mégaloblastique; les anémies par destruction sanguine comprennent les anémies post-hémorragique, hémolytiques; congénitale et acquise, et érythroblastiques. L'anémie aplastique constitue une forme évolutive commune, souvent terminale, de la plupart des anémies précédentes.

Dans un tableau synoptique l'auteur tente de mettre en regard de chaque type hématologique les facteurs étiologiques ou les formes cliniques et les sanctions thérapeutiques qui semblent suivant les cas être commandées par l'appréciation des divers facteurs hématologiques ou étiologiques.

LE TRAITEMENT DES ANÉMIES CHRONIQUES.— Docteur L. N. Larochelle.

Des différents modes de traitement des anémies chroniques et des multiples préparations médicamenteuses qui les composent, nous devons retenir surtout la diète, la médication martiale et l'opothérapie.

La diète ne joue plus le rôle de premier plan qu'elle occupait au temps de Minot et Murphy, mais elle n'en demeure pas moins un adjuvant précieux de la médication à l'heure actuelle. Une diète bien ordonnée vise à éduquer le patient et de plus doit être substantielle et bien adaptée tant aux conditions du tube digestif qu'aux besoins des organes hématopoïétiques.

La médication proprement dite se partage entre les préparations ferrugineuses et opothérapiques. Tandis que les premières corrigent électivement les anémies hypochromes et microcytaires, les secondes améliorent les anémies hyperchromes et macrocytaires.

L'utilisation du fer est subordonnée à certains principes qui peuvent se résumer par les mots: qualité, quantité, acidité du milieu et catalyseurs. Les sels ferreux s'absorbent mieux que les sels ferriques et les sels de la chimie inorganique sont préférables à ceux de la chimie organique. La quantité optima du médicament varie avec les individus et avec les nombreux sels employés. Il faut aussi tenir compte que les doses fractionnées donnent un meilleur résultat que les doses massives. Les métaux, tel le cuivre, jouent un rôle de catalyseur, mais ne sont que rarement nécessaires.

La médication opothérapique que comprend l'hépatothérapie et la gastrothérapie sont de découverte bien plus récente. Aujourd'hui, les injections intra-musculaires d'extraits concentrés de foie, sont cinquante fois supérieures à l'ingestion de foie.

La gastrothérapie est née de la découverte de Castle, en 1929. Basée sur la découverte un facteur extrinsèque d'origine alimentaire qui activerait un principe intrinsèque contenu dans le suc gastrique, elle a conduit à l'emploi d'un nouveau produit que est extrait de la muqueuse desséchée d'estomac de porc et qui se prend par la bouche.

LA TRANSFUSION SANGUINE DANS LES ANÉMIES.— Docteur Fernando Hudon.

Dans l'anémie aiguë, il faut donner une quantité de sang nécessaire pour maintenir un régime circulatoire compatible avec la vie.

Dans l'anémie chronique, la transfusion sanguine devient nécessaire si le malade est trop anémique; elle stimule l'hématopoïèse, si le malade ne répond pas au traitement causal, elle est utile parfois pour mettre les organes hématopoïétiques au repos.

On attribue, aux éléments cytologiques surtout, les changements biochimiques qui se produisent dans le sang conservé, mais la nature essentielle du processus reste encore inconnu.

Le sang conservé est effectif dans l'anémie aiguë, l'anémie chronique, mais il est très inférieur au sang frais dans le traitement des anémies avec infection, des anémies avec états hémorragiques et des anémies par atteinte des organes hémiformateurs.

Members are reminded that the regular Annual Meeting of the Canadian Medical Association will be held in Toronto, at the Royal York Hotel, the week of May 22 to 26. Make your reservations early. It will be a good meeting.

Correspondence

An Answer to Dr. Heagerty

To the Editor:

In your issue of February, 1944, you published a letter from Dr. J. J. Heagerty in which he directs certain comment to material published in your January issue, originating with the Committee on Economics of the British Columbia Division of the Canadian Medical Association. As Chairman of that Committee I wish to accept full responsibility for the material published from that source.

Dr. Heagerty's letter follows the same line as a letter previously addressed by him to the Editor of the *Vancouver Medical Association Bulletin*, when the article to which Dr. Heagerty objects was published in that Journal. It would seem to me that there is no better answer to be made than to re-publish the letter written by Dr. Turnbull at that time, which is as follows:

"To the Editor:

"I am sorry that in my résumé of the Minutes of the Proceedings of the Special Committee on Social Security I inadvertently wrongly attributed to Dr. Heagerty a remark made by his colleague, Mr. Watson. Dr. Heagerty infers, in his letter to you of October 18, 1943, that leaving out this statement by Mr. Watson will absolve Dr. Heagerty of any charge of being inconsistent in his references to the Committee about costs.

"May I quote from my review the paragraph in question, leaving out Mr. Watson's remark: 'In one speech Dr. Heagerty claimed that it (cost of complete medical care in Canada) was a very precise and accurate figure, decided upon by professional statisticians who are acknowledged experts'—Vol. 4, p. 127. On the other hand, he made such statements as the following: 'Insofar as cost is concerned we certainly are not high. There is always some danger that we may be low, but we just do not think so'—Vol. 3, p. 103. 'We have not attempted to estimate to the last dollar or to the last cent what Health Insurance is going to cost from the standpoint of treatment'—Vol. 2, p. 57.

"The Economics Committee of the British Columbia Medical Association is very grateful to Dr. Heagerty for the recent documents prepared by his Advisory Committee in reference to the costs of medical care.

Yours very truly,
FRANK TURNBULL."

The members of the Committee on Economics of the British Columbia Division of the Canadian Medical Association are much concerned and rightly so, over the methods used to determine the costs of the contemplated service. When we made our original comments in this regard we felt that they were well taken. Dr. Heagerty's subsequent reaction has seemed to rather prove that we have hit a tender point.

In truth he "doth protest too much".

G. F. STRONG,
Chairman of the Committee on
Economics, British Columbia Division
of the Canadian Medical Association.

Vancouver,
January 31, 1944.

Canada's Doctors with the Forces

To the Editor:

There is not a great deal of evidence to indicate that the above named have not done an exceptionally good job from the time of their enlistment to the present. The same was true of their fathers in the last war. It is a matter of record in this war that no matter how tough the going, the medical services have been worthy of special mention.

Not the least difficult of the duties of a medical officer in the army is the day by day routine of Medical Boards, Medical Inspection, Categorization, Reboarding and Documentation. This duty is done in far from glamorous surroundings and on the foundation of this tiring, exacting, largely uninteresting routine rests the success or failure of all training and effort in the field.

Every Canadian doctor in the uniform of his country, either newly graduated or aged in practice, has made a willing sacrifice of the very best years of his life, because we all know that a doctor only begins to earn late in life due to the long period of education which precedes his qualification. Men in other walks of life have an extended period of earning compared to a physician.

Why all this build up? Simply because in the month of January at Fredericton, New Brunswick, three doctors in khaki have appeared before a General Court Martial charged with neglect in their examination or treatment of a soldier who died after being examined and attested in the Canadian Army.

The court appointed by the Government of our country was carefully chosen, including men skilled in the law, medicine and army practices and skills. The prosecuting and defending counsel were well and widely known in legal circles. The Judge Advocate General was ably represented. Every tittle of evidence available was produced and carefully evaluated. Expert witnesses of great prominence were provided. After an exhaustive and exhausting trial lasting many days, this extra special court found all three medical doctors "Not Guilty".

So far, so good, but there was another trial, a newspaper and word of mouth trial with very generous coverage by the press and radio—Canada-wide. Granted that the reporting was accurate and fair and that the trial reporter was competent, experienced and just, yet the best news despatches are capable of initiating comment by writers at a distance which may exhibit unpleasant bias or criticism while the verdicts were still in doubt.

All three accused were acquitted by a competent army court, but thousands of people who perhaps read despatches covering the early days of the trial never noticed or never heard that the charges were disproved. In the minds of such there is placed a suspicion that army doc-

tors are careless or incompetent. The morale of troops is injured, recruiting is not benefited, mothers wonder if their sons will receive good medical care in the forces. A useful profession receives an unearned black eye. Doctors in and out of the services wonder if their professional reputation is safe in the hands of the Department of Defence.

The question is asked, How else could this matter be cleared up? and the answer suggested is, first, that an inquiry by competent medical authority which is not lacking within or without the R.C.A.M.C., would have shown the same result as was determined by the Court Martial. Such medical tribunal could have received every assistance from the Judge Advocate's Department and the finding would have satisfied the most critical inquirer. All this without the publicity so damaging to a professional career.

Second, if persons or groups critical of the Government, army or the individual officer had seen fit to instigate a civil suit in such a case, how much more fitting and dignified it would have appeared if the Department of Defence had provided the same facilities for investigation as were provided at the Court Martial, but instead of prosecuting the officer had defended their servant in uniform with every agency at their command.

This would have (a) shown the faith of the Government in their servants; (b) maintained the pride of service in the hearts of serving soldiers; (c) protected the intangible but essential reputation of a serving doctor in the eyes of the public and in the minds of those he serves and (d) presented a united front of all services to the carping, frivolous or malign critics of our country and its servants in these difficult times.

The result in the present case has been happy, but damage has been done which certainly can never be paid for. Let us hope that those placed in authority over us will strive to prevent a recurrence of an injustice to individuals which it seems could have been avoided.

A. STANLEY KIRKLAND.

Saint John, N.B.

[Received for publication February 7, 1944.]

Methods of Payment for Medical Services

To the Editor:

As in the last edition of your *Journal* comments on capitation system versus fee-for-service are asked for, here is my opinion.

I am convinced from experience in other countries where I saw it work in a fashion, that the whole Health Insurance scheme is in the end disastrous for the profession and ultimately not at all beneficial to the country for reasons it would take too long to discuss in detail here now. However if we have to have it (as a

necessary evil) the *only* system is of course a fee-for-service system, for the following reasons:

1. It disturbs the least the existing relationship between patient and doctor.

2. It pays for actual work done only, retains a definite financial incentive in each and every case and also maintains the competitive factor in each and every case, all year around.

3. Under the system there is no difficulty in arranging for specialists' work and pay.

4. Under a fee-for-service system there is no difficulty in making fair and just settlements as regards driving, which would be extremely difficult or impossible under a panel system. General practitioners, particularly in the west, have to drive thousands of miles per year. How could a panel system do justice to transportation expenses involved?

5. It preserves the greatest freedom of choice of doctor, (and patient) as a decision is made from case to case and not once a year or so when panel canvassing may go on.

6. It is sound, logically and economically. Nobody would think of paying a flat fee for, say, goods to be bought in a store—for one year—and no storekeeper would accept such a proposition with anything but ridicule.

What is good business sense in ordinary purchasing should be good sense in medical economics too, once we accept what seems to me the rather unpalatable fact that medical services are to be bought and obtained like pork and beans, at a fixed price, anywhere, as some one said in the *B.M.J.* they can be "laid on like gas and water".

F. L. EID, M.D.

Macklin, Sask.,
January 18, 1944.

To the Editor:

In reference to the article appearing in the January issue under "Medical Economics", I wish to congratulate you on a very concise presentation which seems to me to crystallize the thinking of the Central Committee, as well as that of the medical organizations across the country, on the arguments for and against various proposals for the payment of doctors.

You have asked for comments and I am taking the liberty of making one or two observations.

Under "Fee for Services", it seems to me that the idea expressed under No. 1 should be more fully stressed, as, under any health insurance scheme, it should be considered of primary importance that the slightest possible deviation from the customs which have been evolved from practical experience over many generations of physicians, and which, on the whole have proved very satisfactory, should be permitted.

Under "Capitation", the suggestion that it has worked well in Great Britain is only stating half the truth, as the conditions here would not

be at all similar. Over there, as I understand it, it is only the least remunerative type of medical practice that is covered by the "panel" and any doctor has the privilege of establishing himself in the ordinary open competitive practice and discontinuing his "panel practice" at his own pleasure. As a majority of the provinces in this country have expressed a preference for a complete coverage, the situation is entirely different.

Also, under the disadvantages of the system of Capitation Fees, I would add another. It would render necessary the use of a "panel". I have strong objections to the use of a "panel", particularly with an over-all coverage. First, it would tend to interfere with that almost undefinable personal relationship which should exist between doctor and patient. There would be a certain feeling of compulsion which would form something of a barrier to that complete freedom of action on the part of each. I feel certain that any experienced general practitioner would understand just what I mean and I believe that the great majority of general practitioners in the country prefer not to carry on a panel practice, and, since this whole scheme is presumed to be centred around the general practitioner, I think this point is worthy of consideration.

Secondly, it would definitely interfere with the privilege and opportunity of the new doctor becoming established in any community if everybody in that community were already on some other doctor's panel. We are bound to consider the rights and privileges of the ex-Service doctors, should an insurance scheme come into force before the termination of hostilities and also those of the annual group of new graduates seeking an opportunity to establish themselves.

F. T. CAMPBELL.

Calgary, Alta.,
February 5, 1944.

Lay Administration in Medicine

To the Editor:

The section on Medical Economics is excellent. Here is a clipping from *The Lancet* which expresses my views after one year as a municipal doctor.

"If medical planners want to know what practice will be like under the control of a lay committee of a local authority or group of authorities, they need only ask their colleagues whose life has been tied up with aldermen and councillors. Utopia for medicine will need a new type of layman in the council chambers of democracy if laymen are to have the final say in the destiny of our profession."

This I think is the whole thing in very few words.

I joined the army after this and after being overseas was invalidated out.

I sincerely think that the governing body of any system of health insurance, regardless of what method is employed, should be a body of medical men and not laymen.

A. W. SALTER.

Saskatoon,
January 25, 1944.

Special Correspondence

The London Letter

(From our own correspondent)

THE RETURN TO WORK

Practical expression has recently been given by Parliament to the word "rehabilitation", and Mr. Tomlinson whose committee did so much to clarify this subject has introduced a Government bill which covers rehabilitation in hospital, after hospital and the problems of re-settlement in a job.

It is this third point which is likely to cause most controversy because disabled persons as a whole do not want to be on a special register and do not want to be taken on because an employer has got to have so many disabled persons on his staff. What so many people feel is that it is so much better to surmount difficulties and not to become "cripple-minded".

The early phases of rehabilitation are less controversial, but perhaps still in an experimental stage. Certain centres have been opened for the post-hospital rehabilitation and the Ministry of Health has now set out various points regarding what can be done in the hospital. A definite program to cover the stage of convalescence in hospital is suggested and in fact the doctor in charge is to write a prescription for this just as he now prescribes medicine.

On rather more specialized lines may be considered the work of Papworth and Roehampton. The former is where tuberculosis patients prove that they can live in a community as economic units and the latter is where a special centre deals with artificial limbs. There will be cripples after this war, unfortunately, but certainly every provision is being made for their physical well-being and it is only perhaps on the mental and education side that there is still room for a strong lead.

MORE ABOUT NURSING

After various official reports on nurses' pay, we now have before us the Royal College of Nursing Committee with Lord Horder as chairman, with most important recommendations on the education, training and recruiting of nurses. The official policy seems to have been to attract candidates to the nursing profession by increasing the pay of the student nurse. The Horder

committee radically opposes this and says that the nurse should pay for her training, with liberal grants and scholarships to enable her to do this. Only in this way, it is felt, will many of the objections to the use of student nurses as cheap sources of labour, disappear.

The committee therefore logically suggests the reduction of training schools for nurses and they also recommend wider basic training and many variations in the methods of teaching. From the point of view of recruitment it is pointed out that there has never been a shortage of recruits but there is a relatively large failing during the training period which suggests that conditions are not altogether satisfactory.

This is no new problem but it certainly will not be solved by mere increases of pay. More freedom, more domestic help, better food, and more attention to the health of the nurses are all recommended by the committee in their broad proposals.

CONSULTANTS AND SPECIALISTS

By the time this letter appears, it is probable that the Government's views on the future of medical services will be known and although not so much under discussion as the general practitioners, the specialists and consultants are just as anxious to know what is in store for them. In England, the three Royal Colleges have a standing joint committee and by securing representatives from specialties and various hospital staffs, they provide a machinery for seeing that the views of consultants and specialists are understood. Later, such a body may well have to consider to some extent terms and conditions of service.

For the moment however, as has recently been announced, the colleges in conjunction with the universities are conducting a survey into the numbers of consultants and specialists available in the country for the guidance of the Ministry of Health. For the future, they have agreed on certain definite criteria for the training of consultants and specialists and this will certainly serve in time to raise the whole standard of this section of the profession. As was pointed out the other day, Harley Street is only an address, not a degree, and at the moment there is nothing to stop any registered practitioner from setting up his plate and calling himself a specialist.

GEORGE CRANSTON ANDERSON

The loss of Anderson, secretary of the British Medical Association, caused great sorrow in the profession. Elsewhere, no doubt, tributes will be paid to his memory and details given of his splendid work. But a fellow Scot with a very similar background and upbringing must add a short personal note: the memorial service which I attended was literally packed and many who

came there, although representing societies and official bodies, had asked to come in such capacity because of their affection for the colleague who had gone. There was an atmosphere of communal sorrowing which in itself was a testimony to the man's personality and influence.

London,
February, 1944.

ALAN MONCRIEFF.

Abstracts from Current Literature

Medicine

Galactose Tolerance Tests in Thyrotoxicosis. Barnes, C. G. and King, E. J.: *Quart. J. Med.*, 1943, 12: 129.

Thyrotoxic patients have a diminished tolerance for both glucose and galactose. The glucose tolerance test cannot be used as a diagnostic aid because it may be upset by various factors; glycogenolysis from emotional causes, changes in rate of tissue utilization of glucose, and variations in the renal threshold. Galactose is not open to these objections, because it is converted into glycogen by the liver (and released as glucose), and it is only slightly metabolized by tissues other than the liver and, if there is a renal threshold for galactose it is exceedingly low.

The object of the investigation was threefold: (1) to confirm the presence of a diminished tolerance to galactose when administered orally in thyrotoxicosis, particularly in mild cases where further diagnostic aid would be valuable; (2) to determine if the lowered tolerance paralleled the severity of the disease; (3) to attempt to determine the reason for the lowered tolerance.

The clinical material consisted of 40 thyrotoxic patients (35 diffuse toxic goitres and 5 toxic adenomata), 15 suspected cases which were later proved not to have hyperthyroidism and 25 normal controls. Impaired tolerance was found in all obvious cases and in all but four of seventeen mild cases. In only one of the fifteen patients suspected of thyrotoxicosis, where the diagnosis later was changed, was the tolerance lowered abnormally. This patient suffered from persistent post-diphtheritic tachycardia. It is the opinion of the authors that it is necessary to exclude both active infections and liver disease before the galactose tolerance test can be relied upon. The test has certain advantages over the basal metabolic rate. The technique is simple and causes little upset to the patient. The test is relatively little upset by iodine therapy and the laboratory technique is comparable to that used for the ordinary blood sugar. It is particularly valuable for out-patients who may come long distances for testing and whose condition may be far from basal.

No close relation between the basal metabolic rate and the galactose tolerance test was found, although there did seem to be a parallel between the degree of diminished tolerance and the clinical assessment of the patient.

NORMAN S. SKINNER

The Pathological and Clinical Findings in Blast Injury.

Tunbridge, R. E. and Wilson, J. V.: *Quart. J. Med.*, 1943, 12: 169.

A careful study of cases of blast injury is reported from Malta and the relevant literature reviewed. The main post-mortem findings are congestion of the blood vessels, more especially of the capillaries and smaller arterioles, and hæmorrhage. The lesions occur in any part of the body, but the lungs and ear drums are most commonly affected. The clinical manifestations can be fully accounted for by the presence of hæmorrhages.

It is shown that a blow can cause identical lesions and the more widespread lesions in blast injuries is due to the intensity and wider spread of the traumatic force.

The majority of cases show only minor symptoms and signs and are often overlooked, which matters little since rapid recovery ensues. At times, however, this type of case may be mistakenly considered as a psychoneurosis. The moderately severe blast injuries may be subdivided into three groups: (1) those with blast injuries alone; (2) those with an associated injury and (3) those of either of the first two groups where the onset of serious symptoms is delayed for forty-eight hours or more. The first group usually show respiratory, abdominal or nervous symptoms, singly or in combination, from the onset, although these may not become obvious until late in the first twenty-four hours. In the second group the associated injury is apt to obscure the picture, evidence of shock may be attributed to the injury and the underlying damage due to the blast may not be recognized. The third group where the onset of serious symptoms is delayed for forty-eight hours or more are difficult to treat and have a long convalescence. The severe cases of blast injury are usually seriously ill from the start and the course is progressively downhill. The authors feel that the clinical importance of blast injuries is over-emphasized. Rapidly fatal cases should be rare with adequate precaution during air raids (lying flat on the open ground or in an open slit trench). The only significant feature is the possible deleterious effect exposure to blast may have upon the normal defensive mechanisms of the body.

NORMAN S. SKINNER

Studies in Diseases of Muscle. Milhorat, A. T.: *Arch. Neurol. & Psychiatry*, 1943, 50: 279.

The patients in this paper were two brothers, whose paternal and maternal grandfathers were brothers. Both had difficulty in walking and in vision in childhood. Wasting of the feet and calves, and of the optic nerve progressed steadily. Ten other patients with a similar syndrome have been recorded in the literature; all were males. In seven of the ten patients, others were affected in the family, thus showing the hereditary nature of the disease. This condition represents either a distinct clinical syndrome, apart from the muscular atrophies, or it is a definite type of the Charcot-Marie type of peroneal atrophy.

One of the four sisters of these two brothers was affected with bilateral optic atrophy and what was probably disseminated sclerosis. The relationship between the disease in the brothers and that in the sister is not understood.

MADGE T. MACKLIN

Surgery

Osteogenic Sarcoma. Macdonald, I. and Budd, J. W.: *Surg., Gyn. & Obst.*, 1943, 77: 413.

There are now 2,400 cases of bone sarcoma documented by the Registry of the American College of Surgeons. Among these are 118 accepted five-year cures which the authors have analyzed from different aspects.

First, they propose a classification in which "osteogenic" implies only "originating in bone". Within this wide meaning, osteogenic sarcomas include osteosarcomas, chondrosarcomas and fibrosarcomas. Ninety-one per cent of malignant bone tumours are one of these types, which occur in the following proportion of frequency: osteosarcoma 12%, chondrosarcoma 48%, fibrosarcoma 31%. The remaining 9% are undifferentiated, mixed, or are non-osteogenic.

The amount of matrix formed by any of the three tumours is not an accurate guide to prognosis. The degree of encapsulation of an osteogenic sarcoma is the only pathological feature which is of favourable prognostic indication, but it is of extraordinary importance. Survival rates are many times higher in tumours with a tendency to encapsulation. True osteo-

sarcoma is almost uniformly fatal. Fibrosarcoma is distinctly less malignant, while chondrosarcoma occupies a position between the two.

Natural selection must partly determine curability because the authors demonstrate the anomaly that there is a higher percentage of cures among cases which have had surgical treatment late than among those which have had early treatment. Biopsies of various kinds do not appear to diminish curability for in this service there are actually more cures, proportionally, among cases which have had biopsy performed than among those with no biopsy.

Irradiation therapy, alone or combined with surgery, has not produced any significant statistical increase in percentage cures, although its palliative value is not denied.

J. R. LACROIX

Roentgenological Demonstration of Spinal Metastases from Leiomyosarcoma of the Uterus. Robbins, L. L.: *Arch. Surg.*, 1943, 47: 463.

Leiomyosarcoma of the uterus is a relatively rare tumour. Metastasis from leiomyosarcoma is even more rare than the primary tumour. The author presents the records of two patients with this type of uterine neoplasm with spinal metastasis.

It is not believed that the present status of roentgenology allows a definite etiological differentiation of osteoblastic metastasis. The diagnosis may be suspected when there is a history of hysterectomy or of preceding leiomyosarcoma of the uterus and if roentgenological study reveals a focus of metastatic malignant growth. It is understood that osteoblastic metastases may be produced by other malignant uterine tumours.

In the author's two cases there was osteoblastic metastasis. This type of metastasis in contradistinction to the osteolytic form, may possibly be explained on the basis of the relatively slow growth of the tumour. It may spread by way of the vertebral veins, as carcinoma of the prostate so commonly does.

G. E. LEARMONTH

Enteric Intussusception in Adults. "Invagination intestinale chez les adultes". Gerwig, W. H. and Stone, H. B.: *Surg., Gyn. & Obst.*, 1943, 76: 95.

L'invagination intestinale aiguë chez les adultes est assez rare. Mais les auteurs citent un cas qui l'est encore davantage: celui d'une invagination jéjunale aiguë associée à de nombreux polypes et du gros intestin et de l'intestin grêle, et en fait l'exposé complet.

Du point de vue anatomique, il y a différentes sortes d'invagination: intestinale, iléo-cœcale, iléo-colique et colique. Ces termes désignent le site où se produit l'invagination. Au point de vue étiologique, on distingue les invaginations aiguës assez fréquentes chez les enfants et affectant surtout la région iléo-cœcale, et les invaginations chroniques plus particulières aux adultes ou aux enfants d'un certain âge qui relèvent généralement d'une cause organique.

Le mécanisme ou processus de l'invagination quand il y a présence d'une lésion organique s'accompagne généralement de spasmes concomitant à un relâchement de l'intestin. Mais dans bien des cas la pathogénie de l'invagination ne peut être retracée.

Les symptômes diffèrent chez les tout jeunes enfants et chez les adultes. Il n'y a pas toujours évacuation de sang par le rectum et alors que les enfants ont des vomissements et toutes les manifestations de la crise aiguë, les adultes évoluent plutôt vers le type chronique.

Le traitement chirurgical est celui qui s'impose sauf dans les cas où l'invagination est rapidement réduite par un lavement ou entéroclyse. Dans ce cas une recherche sérieuse des causes demeure indispensable. En présence de tumeurs une résection s'impose, soit de la tumeur elle-même si elle est unique, soit du segment de l'intestin où elles se trouvent groupées.

PIERRE SMITH

Obstetrics and Gynæcology

Absorption of Radioactive Sodium Instilled into the Vagina. Pommerenke, W. T. and Hahn, P. F.: *Am. J. Obst. & Gyn.*, 1943, 46: 853.

The use of radioactive sodium provides a delicate method whereby the transportation of this substance throughout the body may be accurately followed. Radioactive sodium passes readily into the general circulation following its instillation into a traumatized vagina. Absorption from the intact vagina and/or cervix is less marked.

These experiments suggest the need for special caution in administering douches containing poisonous ingredients, particularly when the vagina and/or cervix have been recently traumatized. ROSS MITCHELL

Studies on the Rh Factor. Schwartz, H. A. and Levine, P.: *Am. J. Obst. & Gyn.*, 1943, 46: 827.

It is clearly established that in most instances erythroblastosis foetalis is produced as a result of iso-immunization of the Rh- mother by the Rh+ fetal erythrocytes. The action of maternal anti-Rh agglutinins on the susceptible fetal red cells is the source of the hæmolytic in the fetus during intrauterine life.

Correlating clinical and serological findings, studies at Bellevue Hospital for a period of 16 months indicate that among 162 consecutive stillbirths and neonatal deaths the incidence of erythroblastosis foetalis is somewhere between 4.4 and 8.2%. Rh studies indicate that the incidence of erythroblastosis foetalis in this series is twice that hitherto given on the basis of clinical and pathological diagnosis.

In cases of intrauterine death occurring well in advance of labour, as evidenced by fetal maceration, the incidence of erythroblastosis is somewhere between 16.6 and 29.1%. This series of 24 cases includes only instances of unexplained intrauterine death of the fetus.

Studies of a relatively small series of cases indicate that the Rh factor is important in the production of late but not early abortions, and that it is unimportant in the etiology of hæmolytic jaundice sicklæmia, hydatidiform mole, and ectopic pregnancies. While infants with erythroblastosis foetalis are often premature at birth, most causes of prematurity appear unrelated to the Rh factor.

Proof for the possible relationship of blood incompatibility of the mother and her fetus to eclampsia and specific toxæmia is still to be provided. ROSS MITCHELL

Breech Presentation in the Elderly Primipara. Racker, D. C.: *J. Obst. & Gyn. Brit. Emp.*, 1943, 50: 352.

In the decision as to which method of delivery should be adopted, when the fetus is normal and healthy, only in those women in this group under 35 years of age, and whose pelves are obviously adequate, when there are no other contraindications, and when there is a good prospect of further children, should the vaginal route be adopted. There are too many unpredictable factors, such as uterine action and deflexion attitudes of the fetus, and the stakes are too high for much risk to be taken. If we rigidly adhere to these criteria, then, the number of primiparæ delivered vaginally will be very small. By Cesarean section, in this group of women, happy results are almost always assured, but during vaginal delivery the spectre of death of the child sits constantly at the elbow of the accoucheur, alert for any abnormality and quick indeed to take advantage of the slightest hitch in the smooth technique of delivery. If any further justification were needed for this somewhat radical attitude it would be this: If operation is carried out, as it often is, possibly rightly, for such non-fatal diseases as so-called chronic appendicitis, subserous fibroids with few if any symptoms, and accidentally discovered ovarian cysts, then surely it should not be withheld from a woman whose only chance it may be to enjoy the supreme fulfilment of her life. P. J. KEARNS

Premature Rupture of Membranes: Effect on Labour at or Near Term. Greig, D. S.: *J. Obst. & Gyn. Brit. Emp.*, 1943, 50: 337.

Three hundred and ten cases of premature rupture of membranes are considered in contrast with a series of 1,680 cases having an orthodox onset of labour. Prematurity has been excluded. Only cases over 36 weeks' gestation are considered. There is a definite increase in the incidence of premature rupture of membranes in cases of abnormal presentations such as occipito-posterior, breech, and twin presentations. Parity and toxæmia are not factors in producing premature rupture of membranes. On the average, over a series, the length of labour is not increased. In 60% of cases, the premature rupture of membranes and the onset of labour are clinically simultaneous. Labour is appreciably shorter than normal in this class of case. When there is a delay in the onset of labour after loss of liquor amnii, labour is appreciably longer and there is a noteworthy increase in the incidence of prolonged labour over 30 hours. Here, probably, is the justification for the old concept of dry labour. Intervention can be kept at least to normal limits in cases of premature rupture of membranes. Good results can be obtained by careful management. These results should be as good as for a normal series of cases. Good environment is a prerequisite. P. J. KEARNS

Pædiatrics

Relation of Protein Content of Mother's Diet During Pregnancy to Birth Length, Birth Weight, and Condition of Infant at Birth. Burke, B. S., Harding, V. V. and Stuart, H. C.: *J. Pæd.*, 1943, 23: 506.

This paper is one of a series dealing with the importance of diet during pregnancy to both the mother and her infant: 216 mothers and their infants were studied. The material presented is from the Department of Child Hygiene, Harvard School of Public Health. Pregnancy, especially the last two trimesters, is a period of rapid growth and development. It has been estimated that an additional 10 to 20 gm. of protein is necessary above the woman's normal daily requirement. In the group of women studied, it was found that only 10% consumed diets which contained such adequate amounts of protein. A significant relationship was found to exist between the protein content of the mother's diet during pregnancy and the birth length of her infant. This increase in birth length can be demonstrated with each additional increment of protein in the prenatal diet irrespective of mother's height.

An increase in birth weight could also be demonstrated with each additional increase of protein. Since birth length and weight are important in estimating the physical ratings of infants, it follows that there is an increase in the general physical well-being of the infant at birth. S. J. USHER

Roentgen Therapy of Interstitial Pneumonia. Oppenheimer, A.: *J. Pæd.*, 1943, 23: 534.

Thirty-six patients were treated, the majority being about 2 years of age. The diagnosis was based upon the presence of fever, cough and dyspnoea, associated with infiltration along and around the bronchi and bronchioles shown on roentgenograms, with absence of lobar and bronchopneumonic consolidations, and failure of the signs and symptoms to respond to sulfonamide medication.

Following roentgen irradiation with small doses, rapid and consistent improvement of the clinical condition took place in 33 of the 36 patients. With but few exceptions, the temperature, pulse rate, and respiration returned to normal gradually within eight to twenty hours after treatment. The cough became productive for a few days following irradiation. The prominence of the pulmonary stroma on the roentgenogram did not vanish until about one week after clinical cure, and the hila remained enlarged for periods extending to several months. S. J. USHER

Neurology and Psychiatry

Neuroses Resulting from Combat. Smith, Lt.-Comdr. E. R.: *Am. J. Psych.*, 1943, 100: 94.

This article records the experiences of the neuro-psychiatric department of the United States Naval Hospital at Mare Island, California, with particular reference to psychiatric problems as seen in men who have been through very prolonged and unusual combat stress. The patients seen were largely those who came from Guadalcanal and who had been subjected to very marked physical and mental stress. The characteristic symptoms presented by this group of patients were headaches, lowered thresholds to sharp noises, periods of amnesia, of panic, sensory somatic complaints, marked muscular hypertonicity, tremors generalized or limited and functional palsies. Intellectually, these men are normal. Emotionally they are tremendously unstable, showing unbelievable neuromuscular tension, frequently close to tears, or very short-tempered. Men that were formerly proud of their ability to carry their liquor promptly found that a couple of short beers would make them cry like babies or want to fight everyone in sight. The author reports that from the Southwest Pacific two distinct types of cases are seen, the one dull, apathetic, showing the typically accepted picture of mild but definite organic lesions. These require neuro-surgical investigation. The other and far more numerous group appear to have real neuroses characterized by marked anxiety, hypersensitiveness, fatigability with no organic disturbance of the central nervous system. Very few of these cases of war or combat neurosis can return to full combat duty. Only about 10 to 15% have been sent back to limited duty and a good many of these have had recurrence of tension and anxiety states.

BARUCH SILVERMAN

Statistical Analysis of Traumatic War Neurosis in Merchant Seamen. Bellamy, W. A.: *Am. J. Psych.*, 1943, 100: 44.

This is a report on the treatment of 435 merchant seamen in rest centres and medical clinics which have been established for this purpose in seven major United States ports. Of this group 203 were treated for traumatic neurosis and presented the following complaints, nervousness, insomnia, nightmares, digestive disturbances, irritability, uncontrolled aggression, hypersensitivity, restlessness, palpitation, trembling, fatigability or weakness, sweating, and stammering. In the approximate order of their frequency the initial psychological reactions to torpedoing are excitement, fear and anxiety, acute confusion, panic, stupor, fugue, unconsciousness, with or without convulsions. At the time of shelling, dive bombing or torpedoing, reactions of fear and anxiety are universal. Few seamen are actually without fear. The severity of the initial reaction is directly proportional to the intensity of the enemy action. With intense enemy action, such as encountered in former convoys to Malta or Murmansk an occasional seaman may fall in a dead faint, have convulsions, go into a fugue state, or become so acutely agitated or psychotic, that restraint is necessary. The degree of amnesia is greater with the increasing severity of these reactions. Two special points are made regarding this group of patients. (1) The usual pre-war psychoneuroses predispose little, if at all, to the formation of a traumatic neurosis upon exposure to enemy action. (2) Many cases of pre-war psychoneuroses can be exposed to severe traumata of war without developing a traumatic neurosis.

BARUCH SILVERMAN

The Inheritance of von Recklinghausen's Neurofibromatosis. Herndon, C. N. and Dudley, F. C.: *J. Bowman Gray School of Med.*, 1943, 1: 69.

The patient whose family tree is reported began to have progressive paralysis of the legs, with loss of sensation, followed by paralysis of the arms at the age of 31. Atrophy and contractures of the legs,

café-au-lait spots over the trunk and extremities, and numerous subcutaneous nodules associated with peripheral nerves then developed. Investigation showed that this condition had existed in 5 generations of this family, affecting males for the most part. One man in generation I, 2 of his sons in generation II, the 3 sons of one of them in generation III were affected. Two of these 3 had affected children, one having 3 sons and a daughter, and 2 grandchildren with the disease. In every instance, the affected persons had an affected parent. The gene for this disease is said to have more penetrance in the male than in the female, that is, males who have inherited the gene for the defect are more liable to be outspoken cases of the disease. MADGE THURLOW MACKLIN

Therapeutics

The Significance of Joint Pains Caused by Sterile Streptococcus Toxin. Rhoads, P. S. and Aforemon, M. L.: *Ann. Int. Med.*, 1943, 19: 60.

In 1937 Healey reported that about 3% of young adults being immunized against scarlet fever developed multiple joint pains as a reaction to one or more injections of the sterile filtrate of broth cultures of scarlet fever streptococci. The majority of persons who develop this reaction gave a history of previous joint pains associated with rheumatic fever, or of streptococcus infections of the nose and throat.

The studies prompted the authors to investigate the health performance of a group of student nurses who had multiple joint pains as a reaction to one or more immunizing doses of scarlet fever toxin. Their observations support the view that a type of sensitiveness to haemolytic streptococcus toxin is present in a high proportion of persons who have had rheumatic infections or who harbour chronic streptococcus infections which is not present in other persons. It is manifested by the development of joint pains when streptococcus toxin is introduced into their tissues. Such persons appear to develop rheumatic affections, such as heart disease, poly-arthritis, and erythema nodosum more frequently than other persons not similarly sensitized. S. R. TOWNSEND

Experiences Associated with a Transfusion Unit in a 700 Bed Hospital: An Annual Survey of over 3,500 Administrations of Blood and Plasma (dried). Erf, L. A. and Jones, H. W.: *Ann. Int. Med.*, 1943, 19: 1.

From 3,906 donors blood was withdrawn and in this group, 1.8%, the Kahn or Wassermann test was positive. The unit issued 2,896 blood transfusions, 3.2% of which were followed by reactions, and 695 of plasma (dried) infusions, 0.14% of which were followed by reactions.

The reactions were classified as (1) chills without fever, (2) chills with fever, (3) urticaria, and (4) incompatibilities. The pyrogenic reactions, or chills with fever were most frequent.

Dried human plasma apparently is as effective clinically as dried human albumin, where these agents are restored to one-fourth their original volume. Concentrated plasma almost invariably causes haemodilution, and a rise in blood pressure.

Intra-endothelial routes, other than venous routes of administering blood or plasma have been life-saving in the authors' experience.

S. R. TOWNSEND

Ophthalmology

Choroidal Detachment. Rycroft, B. W.: *Brit. J. Ophth.*, 1943, 27: 283.

The occurrence of this condition is traced from 1868, when Knapp reported the history and pathological examination of a case of choroidal detachment in which the eye had been removed by mistake for sarcoma. This was an era when the classical iridectomy was much in favour for acute glaucoma and many eyes were enucleated for tumour when, after the oedema of the cornea improved following the iridectomy, a choroidal

detachment became visible. Several eyes suffered the same fate in connection with cataract removal at that time. Fuchs, by 1902 had seen 37 cases of choroidal detachment which had occurred on 23 occasions after 493 cataract extractions and on 11 occasions after iridectomy for acute glaucoma.

The author mentions many theories as to the cause of these detachments and lists Barkan's four classes. (1) Tear of the ciliary body with aqueous percolating into the suprachoroidal space (simple type). (2) Traction on the choroid and retina by organizing masses in the vitreous (traction type). (3) Sub-choroidal hæmorrhage (degenerative type). (4) Massive choroiditis with sub-choroidal exudate (inflammatory type).

As a result of investigations into this condition he states the following conclusions as to the etiology: (1) That detachment of the choroid is primarily due to a forward movement of the diaphragm, consisting of ciliary body, suspensory ligament and lens. This probably results in a tear near the ora serrata. (2) The reason the detachment occurs in some trephines and not in others is due to a difference in the depth of the anterior chamber. With a deep chamber there is greater forward movement of the iris-lens diaphragm. (3) When the peripheral tear in the choroid heals, the aqueous passes into the anterior chamber. If the conjunctival flap is healed and has no leak, the anterior chamber reforms and the filtration bleb appears. The fluid in the choroidal detachment is subsequently absorbed.

He states that treatment is almost generally ignored in textbooks. Colonel Elliot felt that patients should be allowed up and that most cases righted themselves. The most satisfactory form of treatment seems to be associated with a closure of the fistula in the conjunctival flap.

In conclusion, the author mentions two sequelæ of choroidal detachment. First, is the fact that when a trephine case has a detachment of prolonged duration the bleb is usually flat and filtration is scanty. Secondly, if the anterior chamber remains unformed for longer than a week, an attempt should be made to seal the leak and to refill the anterior chamber with saline, as there is then a real risk of anterior capsular changes by contact.

A. ERNEST DOULL

Radiology and Physiotherapy

Experience with the 1,000 Kilovolt Roentgen Therapy Unit at Memorial Hospital. Hocker, A. F. and Guttman, R. J.: *Am. J. Roent.*, 1944, 51: 83.

Physical measurements show that at greater depth the higher voltage does deliver a larger dose than is possible with the lower unit. Moreover, when small fields are used the increased depth dose becomes even greater since there is little scattered radiation. This advantage is lessened when the cross-fire technique is used with the higher voltage unit. The dose on the surface of exit somewhat offsets the practical value of the greater depth dose. The million volt unit, however, does permit the use of a small field. This is an apparent advantage, for in the clinical application of roentgen radiation a field should be used that will include the tumour in its entirety with as little of the surrounding normal tissue as possible. Another advantage is the relatively greater depth dose in the smaller fields in comparison to the 200,000 volt machine. The present analysis would seem to indicate, however, that the million volt machine is not a substitute for the 200,000 volt unit; that its use is limited to the treatment of deep-seated tumours. But at a depth of 7 or 8 cm., the lower voltage unit gives nearly as great a dose as the higher voltage unit, and since the former is a more flexible machine it is better to use it in the treatment of tumours within that range. On the other hand, in the treatment of deep-seated tumours, especially those near vital organs, the higher voltage unit is better.

The treatments were given in daily fractional doses of 250 to 400r, measured in air. As a rule, the patients

tolerated them better than similar patients under the 200,000 volt machine. Roentgen-sickness was less; it was not even a problem. With a few exceptions the skin reaction from a total dose ranging from 2,100 to 5,000r per portal was not severe.

R. C. BURR

Head Injuries. Mock, H. E.: *Radiology*, 1943, 41: 527.

This is a review by the author of over 6,000 cases of head injury treated between 1928 and 1940. He divides the treatment used in these cases under the following heads: good, average, and poor depending on the percentage death rate. He has then made a study of the treatments used. With reference to x-ray he states, "Every head injury case should have an x-ray examination, but never in the presence of shock, deep coma, or wild delirium". He has listed the following table of management which he believes gives improved results: (1) Treat cerebral shock first; (2) avoid adding insult to injury; (3) chart course hourly; live with the patient; (4) blood transfusion for persistent shock or severe associated injuries; (5) oxygen early for persistent unconsciousness, cerebral anoxia, threatened respiratory failure, or associated chest injuries; (6) postural drainage or aspiration; (7) adequate dehydration: spinal drainage operation—each when and if indicated by signs and symptoms; (8) avoid overdehydration. Maintain fluid balance without pushing fluids. Prolonged dehydration may be the cause of death; (9) do spinal puncture early when indicated. Drain an adequate amount of fluid. Early operation is seldom indicated; (10) maintain nutrition. Feed by stomach tube if necessary; (11) avoid oversedation. Seldom, if ever, use morphine; (12) consider the patient, not the family, nor the surgeon's convenience.

R. C. BURR

Pathology and Experimental Medicine

Studies on the Therapy of Hæmorrhagic Shock. Necheles, H., Levinson, S. O., Janota, M., Weston, R. E. and Weissman, J.: *Surg., Gyn. & Obst.*, 1943, 77: 337.

Dogs were bled until low blood pressure, reduced circulating time and other signs of massive hæmorrhage (shock?) were produced. Two groups of dogs were then treated, one with whole serum or plasma, and the other with concentrated serum, immediately subsequent to the bleeding.

It did not surprise the authors, nor will it astonish anyone else, to find that the signs of hæmorrhage were quickly overcome with adequate amounts of plasma, while infusion of concentrated serum largely failed to produce recovery. In the absence of abundant fluids by mouth or from the tissues with which the concentrated serum could be diluted to normal viscosity in the blood stream the infusion of such serum did little more than overburden the circulation and produced bradycardia and a drop in the diastolic pressure.

The authors have conducted a satisfactory experimental demonstration of this rather obvious bit of physiology.

J. R. LACROIX

Hygiene and Public Health

The Etiology of Malignant Diphtheria. Frobisher, M.: *Am. J. Pub. Health*, 1943, 33: 1244.

Variation in the virulence of diphtheria is well known. In recent years on this continent the disease has been relatively mild, but isolated outbreaks of severe types of the disease have been reported. In Canada the most noteworthy is that which occurred in Halifax in 1941.

Bacteriologically, a number of strains of *C. diphtheriæ* are recognized. One strain, *C. diphtheriæ gravis*, from its name, would appear to be causally related to malignant diphtheria. The author does not believe this is so. A number of strains of so-called *gravis*

organisms have been found actually to be wholly atoxigenic. The author's criteria for differentiation between the gravis and mitis strains are as follows:

	gravis	mitis
Fermentation of starch	+	-
Fermentation of glycogen	+	-
Colony	rough	smooth
Hæmolysis (broth)	-	+
Final pH in broth	7.5 or above	7.4 or below
Growth in broth.	granular	even turbidity
Pellicle	+	-

With these criteria individual strains of either gravis or mitis may or may not be virulent.

One of the salient features of malignant diphtheria is refractoriness to diphtheria antitoxin, but this quality has not been found experimentally. It is suggested, therefore, that malignant diphtheria may be due (a) to some quality of *C. diphtheriæ* which has not been demonstrated, or (b) to some wholly extrinsic factor acting in combination, or (c) variation in host resistance. In regard to (a) various hypotheses have been advanced to account for malignancy in the organism itself such as ability to produce toxin in the presence of iron or ability to produce a special toxic substance. These may be regarded at present as hypotheses only.

In regard to (b) evidence is given to suggest that the streptococcus might be a factor acting in combination with *C. diphtheriæ*.

FRANK G. PEDLEY

Mortality Among Children with Rheumatic Fever.

Statistical Bulletin, Metropolitan Life Insurance Co., 1943, 24: 9.

This article covers the experience of 2,817 juvenile policyholders of the Metropolitan Life Insurance Company, who received nursing care for rheumatic fever between 1936 and 1938, and who have been followed up every year since.

In this period (an average duration of 5 years) 257 children have died, or one out of every 11. Children, who were definitely reported to have had heart involvement during the attack for which they received nursing care, represented about 25% of the total; 60% of the mortality was in this group. These children with reported heart involvement showed a mortality of 184 per 1,000 in the first year following the attack, 23 per 1,000 in the second year and 16 per 1,000 in subsequent years. The comparable figures, in children without reported heart involvement, are 18 per 1,000 in the first year following the attack, 11 per 1,000 in the second year and 7 per 1,000 in subsequent years. But even a 7 per 1,000 annual mortality is 5 times that expected for the age groups involved.

The study clearly indicates the seriousness of rheumatic fever in childhood. The disease stands today as a leading cause of disability and death in young persons.

FRANK G. PEDLEY

DESPECIATED BOVINE SERUM.—Substitutes for human plasma hitherto prepared have not fulfilled the three criteria: (a) retention in the circulation and eventual metabolism; (b) exertion of an equivalent osmotic pressure; and (c) non-toxicity, non-antigenicity, and freedom from antibodies. Bovine serum can be made safe for man by destroying the antibodies by heating to 72° C., while rendering the proteins uncoagulable with the addition of 0.2% of formalin and ammonia. Material so prepared appears to accord with the above precepts. Clinical trial in 26 cases shows that it can be administered rapidly and in large amounts to man with safety—F. R. Edwards, *Brit. M. J.*, 1944, 1: 73.

Obituaries

On the eve of going to press we learn with the deepest regret of the death of Dr. Alexander Primrose. We shall postpone to our next issue the detailed notice which is due to so prominent a figure in our profession.

Dr. George V. Bedford, skin specialist in Winnipeg since 1919, died suddenly in Winnipeg, on January 6, at the age of 57. He was born at Emerson, Man., in 1887, and graduated in medicine from the University of Manitoba in 1912. In 1926 he did postgraduate work in London, Eng., and during the first Great War, was on the staff of the Ramsgate Hospital from 1916 to 1917. He held an appointment at the Tuxedo Military Hospital, Winnipeg, from 1917 to 1921 and later established an office at 109 Medical Arts building. He was appointed demonstrator in therapeutic medicine in the faculty of medicine, University of Manitoba, in 1928 and has been lecturer in therapeutic medicine since 1930.

He is survived by his widow, Mary, at present in Toronto; two daughters, Marjorie and Diana; his mother, Mrs. S. H. Bedford; a sister, Mrs. Michael Scott, of Winnipeg; a brother, Robert, of Chicago.

Dr. George Clingan, of Virden, Man., died in Virden General Hospital on January 24 from injuries sustained the previous day. As district coroner he was on his way to view the spot where a fatal motorcycle accident had occurred a few days earlier. Approaching a sharp curve Dr. Clingan's car plunged into a deep gully near Pipestone Creek, and the three occupants were injured.

Dr. Clingan's life was one of service in many fields—medicine, the army, and the legislature. Born near Orangeville, Ont., in 1868, he graduated at Victoria University, Cobourg, Ont., in 1892. He was resident physician at Toronto Children's Hospital, a member of the staff of that hospital from 1893 to 1895, and taught physiology in Toronto Medical College for two years. In 1898 he came to Virden and practised there till his death. He was mayor of the town in 1908 and 1909 and health officer for 30 years for Virden and the municipality of Wallace.

In 1899 he enlisted with the 12th Manitoba Dragoons and rose to the rank of Major. In 1915 he raised the 79th Battalion at Brandon and went overseas at its head with the rank of Lieutenant-Colonel. He commanded No. 2 Canadian Hospital at Outreau, France, and the Canadian Convalescent Hospital at Monk's Horton, England. At the time of his death he was recruiting officer for Virden district, M.D. 10.

He represented Virden constituency in the Manitoba legislature from 1914 to 1922, supporting the Norris Liberal party.

Organized medicine found in him a staunch supporter. He was one of the mainstays of the North Western District Medical Society. For many years he served on the executive of the Manitoba Medical Association; in 1936 was president, and in 1942 was made an honorary member. From his graduation he was a member of the Canadian Medical Association and in 1940 he attained the honour of being made a senior member.

George Clingan stood for high standards in his profession. It was fitting that death should come to him in the path of duty after a full and active life. His sunny disposition won him many friends. In Chaucer's phrase he was "a veray parfit gentil knight".

He is survived by his widow, a daughter and three grandchildren.

Dr. William Frederick Drysdale, the veteran medical health officer of Nanaimo, B.C., died on Christmas day, aged 75.

His name was linked for many years with that of another famous pioneer doctor of Nanaimo, Dr. R. E. McKechnie, now of Vancouver. Dr. Drysdale was a graduate of McGill University (1894). He served for a year as intern in the Montreal General Hospital and came to Nanaimo in 1897 as assistant to Dr. McKechnie, doctor for the miners in the old days.

Dr. Drysdale worked hard at his profession for \$100 a month, and made his calls on a bicycle for a year and was later allowed a horse and buggy, whereby he was enabled to extend his trips as far north as Parksville and south to the Oyster Bay district. It is said that he held a record for confinement cases, having attended the births of more than 10,500 babies in Nanaimo and districts.

In 1900 he married Miss Kate Allen, both being singers in the choir of St. Andrew's Presbyterian Church for more than 25 years. He was an honorary elder of St. Andrew's when it joined in with the United Church of Canada.

Dr. Drysdale was a jubilee medal holder of the British Columbia Medical Association, bearing an honoured name, not only throughout the medical fraternity, but among hundreds who came under his care. Besides his wife, daughter and two grandsons, Dr. Drysdale leaves two sisters in eastern Canada.

Dr. Jules M. Dugas, aged 32, of St. Pierre, Man., was accidentally killed on November 23 while deer hunting in the Brokenhead district, about 50 miles from Winnipeg. He was born at Meyronne, Sask., and had lived in Manitoba five months. He was a general practitioner at St. Pierre, and was one of a party of five who were out deer hunting, when he was mistaken for a deer by one of his companions. Other members of the party were G. Chenard, secretary of the municipality; J. E. Lafrance and J. B. Barand and his son. Dr. Dugas held a B.A. degree from St. Boniface college, and had taken his medical course at Laval University, Quebec.

Survivors are his stepfather and mother, Mr. and Mrs. Louis Girardin, of Meyronne; a brother, Rev. Dominique Dugas, Swift Current, Sask.; two sisters, Mrs. Joseph Balchen, LaBroquerie, Man., and Mrs. Gaston St. Marie, Montreal; and two step-brothers, Guy Girardin, at Camp Borden, and Raymond Girardin, at home.

Dr. Robert Donald Fletcher, for many years active in medical, teaching and musical circles in Winnipeg, died recently in Hollywood-by-the-Sea, Florida. He was 65 years old.

Born in Edinburgh July 17, 1878, Dr. Fletcher came to Winnipeg as a child in 1887 and spent his active life here. He graduated from the Manitoba Medical College in 1903, having previously obtained B.A. and M.A. degrees. He also did postgraduate work at Chicago University and Johns Hopkins. He was appointed lecturer in surgery here in 1904 and in 1919 became associate professor of surgery. He held this post until 1937, when failing health caused his retirement. Dr. Fletcher was a Fellow of the American College of Surgeons and of the Royal College of Surgeons of Canada. He was president of the Manitoba Medical Association in 1921.

His chief recreation was music and he was active in many organizations. His own church was St. George's Anglican but at one time he was organist of Holy Trinity and at another of St. Luke's.

In 1903 Dr. Fletcher married Isabel Graham Johnston who, born in Woodstock, had come to Winnipeg as her husband did as a child. Mrs. Fletcher had been with him in Florida for the last six years and was with him when he died. There are three daughters, Eleanor (Mrs. James W. Kernohan), Rochester, Minn.; Marion (Mrs. Clifford Harford), 959 Dorchester Avenue, and Frances, Tacoma, Wash.

Dr. William E. Hynes, Lacombe, Alta., a pioneer physician, passed away on February 9. He was born in Prince Edward Island in 1877, thus, was in his sixty-seventh year.

Dr. Hynes graduated from McGill University in 1903 and in 1906 came west to Lacombe, where he continued to practice until his death. He was one of Alberta's outstanding surgeons, and would have ranked high in any city had he chosen to leave his country practice. No district was better served than that where Dr. Hynes cast his lot and practised all of his professional years. He leaves a widow and daughter to mourn his loss.

Dr. David Irwin, a physician at Navan, Ont., for the past 23 years, was killed instantly on January 7, when his automobile was struck by the westbound C.P.R. train en route to Montreal from Ottawa, at the level crossing at Blackburn.

Born in Ottawa in 1881, Dr. Irwin lived there for a number of years and was educated in local schools. Following the completion of his medical course at Queen's University (1912), he moved to Cumberland where he practised for a number of years.

In addition to his widow, the former Della Farmer, he leaves one daughter, Meryl, and five sons, David, overseas with the Canadian armed forces, Lorne, Lyle, Lynne and Marvin, all at home.

Dr. James Metcalfe MacCallum died suddenly in his office on December 4, 1943.

Dr. MacCallum was born in 1860 at Richmond Hill, Ont. His parents were the Rev. Joseph Wesley MacCallum and his wife, Mary McBride. In 1881 he graduated B.A. from Victoria University. He taught school for a short time and then studied in the Faculty of Medicine, University of Toronto, graduating M.D., C.M. from the University of Western Ontario in 1886. The next two years he spent in London studying ophthalmology. In 1888 he began practice in Toronto. For a time he combined oto-laryngology with his specialty and also, in the earliest years, assisted Dr. Uzziel Ogden, Professor of Gynaecology.

In 1890 he was appointed Lecturer in Pharmacology and Therapeutics in the University of Toronto. A year later he succeeded to the professorship and resigned in 1907. In 1903 he was made Associate in Ophthalmology. He became professor in 1909. At his retirement in 1929 he was made Professor Emeritus.

On the Council of the College of Physicians and Surgeons of Ontario, Dr. MacCallum represented the University of Toronto from 1909 to 1929 and Victoria University from 1930 to 1932. He had much to do with the raising of educational standards in that body.

AN APPRECIATION

The sudden death of Dr. James MacCallum, brought sudden grief to his friends who had not known of his precarious health.

An oculist of wide reputation, he had been a member for many years of the Faculty of Medicine in the University of Toronto where his teaching was deservedly popular. Eschewing the customary prepared paper in favour of the informal talk, his lectures were notable for their wit and off-hand humour making palatable and pointed the exposition of scientific truth.

Apart from his profession, James MacCallum touched life at many points. To painting, to music, to letters, and to the drama, he brought a singularly acute and well-informed mind. Thirty years ago, greatly daring, he lent practical aid and encouragement to Tom Thomson and the Group of Seven, and did much to make possible their subsequent achievements. There must have been times indeed when his faith in the new movement was sorely tried; but he never faltered, and, in spite of stubborn opposition, often more heated than wise, continued to cheer by his patronage and in other ways, a movement destined to bring a new freedom to the visual arts in Canada.

That we have today a body of Canadian painting, independent in outlook, frankly indigenous, and refreshingly virile, is largely due to his generous support, to an enthusiasm reasoned and steadfast, and most of all, perhaps, to a stimulating encouragement when encouragement of any kind was rare. In music, too, he found welcome surcease from the day's exacting round; in the field of letters he contributed to the periodical press, articles on art noteworthy for their freshness of view and marked individual expression.

His charity was large and indiscriminate. It was long-suffering and kind. It vaunted not itself, but was shy, reserved in its thought of others, unmindful of his own ease or convenience. One of his last acts was to donate two islands in the Georgian Bay to the National Gallery, to be held in perpetuity, as a sketching ground for artists who might resort there. No restriction was to hinder or debar them.

One of the first members of the Arts and Letters Club, he was soon honoured by election to the presidency, a position he filled with credit to the office and to himself. Only a few weeks before his death he was the guest of honour at the Art Gallery of Toronto, at which his old friend, A. Y. Jackson, LL.D., O.S.A., presided, and at which colour reproductions of the work of Thomson and the Group of Seven were shown. Though he said little of this signal mark of recognition, it must have touched him deeply.

As a youth, James MacCallum had been active in sports. Later as a young high school teacher in eastern Ontario towns, he taught his pupils games that developed manliness and self-reliance. Cricket, football, and sailing were his favourites: to him Archibald MacMechan dedicated his *Sagas of the Sea*. Always he laid emphasis on character rather than on scholarship.

Now he is gone it is hard to realize that no more we shall meet him in friendly converse round the luncheon table, no more sit at ease before a woodfire of an afternoon, musing, with monosyllables dropping in disjointed talk. The loom of Time weaves new associations, new habits, interwoven with old memories, old regrets. But in the recollection of his friends he lives, and shall continue to live, please God, so long as life shall last.

WILLIAM COLGATE.

[Reprinted from *The University of Toronto Monthly*, January, 1944.]

Dr. Maurice M. Mayoff, of Montreal, died about January 17, 1944. He was born at Montreal, in 1908, was educated at Baron Byng High School and at McGill University, graduating from McGill's faculty of medicine in 1935. He interned at Kingston, N.Y., opening his own practice here in 1938.

Associated for some years with the Jewish General Hospital and the Woman's General Hospital, Dr. Mayoff took a special interest in the welfare of children. His interest in the younger generations developed a close link for him with the Children's Memorial Hospital.

Dr. Mayoff was also known locally as a lecturer on such subjects as social hygiene and children's health problems. He was interested in music and was at one time a member of the Y.M.H.A. orchestra.

Rifle practice and photography were among his hobbies. He is survived by his widow, formerly Anne Routtenberg; a baby daughter, Joyce Paula; his parents, Mr. and Mrs. Israel Mayoff, and a brother, Ben Mayoff, all of Montreal.

Dr. James Allen Montgomery, former Manitoba physician, died at his Vancouver residence on January 5.

Born in Walkerton, Bruce County, Ont., in 1879, Dr. Montgomery came to Deloraine, Man., with his parents when he was ten. He graduated from the Manitoba Medical College in 1902 and practised in Deloraine for several years. Then he went to England for postgraduate studies and when the last war broke

out he joined the army medical service. Stationed in Essex for some months he was later transferred to take charge of a hospital ship, the *Delta*, carrying wounded Australians from Gallipoli to the base hospital at Alexandria.

He returned to Canada to visit his sick mother but was requested by cable to return to England for another two years. He went back and took charge as medical officer of ambulance work on the battlefields of France and Flanders. In one engagement when all military officers were either killed or wounded Dr. Montgomery took over military command in action. He was awarded the Mons medal, the British War medal and the Victory medal, the Military Cross and a recognition of valour by the French Republic. During the last year of the war he was appointed superintendent of the West London Hospital.

On his return to Canada after the war he opened a practice in oral surgery in Vancouver. In 1919 the flu epidemic gave him charge of a special hospital in Vancouver.

Recently he was granted a life membership in the Vancouver Medical Association.

Surviving are his widow and three brothers, Hugh L., formerly of Deloraine and now of Winnipeg; William G. and John A., Gladstone, Man.

Dr. William Patrick St. Charles, of Toronto, died in Toronto on December 15. First stricken with a heart attack more than a year ago, he contracted influenza a week ago, which developed into pneumonia.

Always shy of public attention and one of the least publicly known of Canadians who had reached great success in both his profession and the financial world, Dr. St. Charles had achieved that success while ministering almost wholly to people who were seldom able to pay his fees, and to whom he never sent accounts.

Dr. St. Charles was born in Belleville 69 years ago, the son of an early mining pioneer, James St. Charles, who had an interest in the Richardson Mine, Canada's first gold producer. He came to the University of Toronto and started practice at Queen and George Streets after graduating. He never married.

Because of his family background he was interested in mining and spent his few vacations in Northern Ontario. Shortly after the turn of the century, and while he was still a youngster in practice, a mining man called at his office while en route to Baltimore, and said a mutual friend had suggested St. Charles as a physician. The mining man was examined, and Doc, as he was known for 40 years, promptly rushed the man to hospital in his first car, a one-lunger.

During the convalescence of the patient, Doc took the young prospector on his tour of calls, so that he could listen to stories of the North. Five years later the miner dropped in again, said he had struck something good, he believed, and wanted Doc to get "in on it". The Doctor did. The find was Lake Shore Gold Mines and the young prospector was the late Sir Harry Oakes. Their friendship ripened through the years and Dr. St. Charles officiated at the birth of Oakes' five children, was chosen by Oakes to succeed him as president of Lake Shore when Oakes retired, Dr. St. Charles retaining also the treasurer's office that he had held since the organization of the mine.

Often urged to retire from practice, Dr. St. Charles refused to "let go", as he described it. On the day of his death, on the desk in his office, among odds and ends like notes from prospectors, boys overseas, and patients whose families he had tended for two generations, his old black satchel stood, exactly where he dropped it last and symbolic of his determination to keep going.

Dr. St. Charles was a member of the Royal Canadian Yacht Club, the Granite Club, the Knights of Columbus, the Ontario Jockey Club and the Thorncliffe Racing Association, of which he was a charter member.

Dr. George Flanagan Shaw, one of the oldest members of the College of Physicians and Surgeons of the Province of Quebec, died on December 2, at Knowlton, Que., in his 84th year.

Born in Ottawa in 1860 and graduating from McGill University in 1893, Dr. Shaw practised medicine for 35 years at St. Andrew's East. After retiring from active practice in 1929, he was appointed medical officer for Canadian National Steamships and acted as ship's surgeon on the West Indies run for several years. He served in the Great War from 1915 to 1919 as a major in the Canadian Army Medical Corps.

Dr. Shaw leaves his widow, formerly Hilda Wainwright; a daughter, Mrs. R. A. Brown, of Kewagawa, Que.; two sons, George, of Toronto and Carter, of Kingston, Jamaica; a sister, Mrs. R. Orr, of Toronto; a brother, Arthur, of Los Angeles, and five grandchildren.

Dr. Ray Zeigler, of Vancouver, died at his home. He was very well known there having practised in Campbell River for twelve years before moving to Vancouver.

A graduate of Queen's University in 1919, Dr. Zeigler came to Vancouver in 1920 and joined the staff of the General Hospital. Later he practised in Anyox and for 12 years in the Campbell River district. Since 1936 he has been in Vancouver. He was a member of Court Stanley Forest, I.O.O.F.

Surviving are his widow; his mother, Mrs. Emma Zeigler; one brother, Clarence, Vancouver; and one sister, Mrs. Wilma Brown, of Vancouver.

News Items

Alberta

The medical situation in various parts of this Province has become acute. In some places well-equipped hospitals are conducted without a physician in the district. In some towns the doctors are much overworked.

The annual refresher course arranged for by the Canadian Medical Association, Alberta Division, and the University of Alberta will be held in Edmonton, May 15 to 19, 1944. While this course is primarily for the practitioners of this province, especial emphasis will be placed on matters of interest to medical officers in the Forces, as they will have to bear the burdens of the future, as soon as they will have been released from military duties. It is planned to have speakers of high standing present in addition to members of the medical staff of Alberta University.

Last year over two hundred physicians registered for the course of lectures and clinics.

It is the intention of the Council of the College of Physicians and Surgeons of Alberta to revise medical fees, as at present the schedule is that of the year 1934, during the financial depression. The scales of fees in other provinces have been collected and they will help in this revision. It has been contended that it would be well to have uniform fees throughout Canada if possible, especially in view of the fact that health insurance may be adopted.

The Minister of Health, Hon. Dr. W. W. Cross, has announced that, commencing on April 1, 1944, free hospitalization will be given all maternity patients. Eighty per cent of such cases become hospitalized, as Alberta has 95 hospitals, besides nursing homes. As soon as the necessary funds are voted for the purpose, regulations and conditions will be announced.

The question of homes for incurables is ever before the Council as at the present time Alberta has no such institutions. The Department of Health has already offered to municipalities a special *per diem* allowance of twenty-five cents, where such homes are established. It has been suggested that hospitals erect additions for this purpose, so that patients may be near their kinsfolk.

G. E. LEARMONTH

British Columbia

The Royal Jubilee Hospital in Victoria is being enlarged by the addition of a new obstetrical building, to accommodate some 85 patients, and plans for this are now in preparation.

It is interesting to note that of the members of the College of Physicians and Surgeons of British Columbia who have so far paid their dues this year, 90% have paid membership fees for the Canadian Medical Association. Under the system observed in British Columbia, membership in the Canadian Medical Association is voluntary, although we are a Division of the Canadian Medical Association. This, we feel, however, is eminently satisfactory and shows the increasing appreciation among British Columbia medical men of the work of the parent body and the necessity of membership therein.

For many years it has been the practice of the Province of British Columbia to issue special licences to medical men who wish to display these on their cars. Of late there have been many robberies from cars so marked, in every case the reason being that the robber is looking for narcotics. For some years we were given a special number, the 19,000 series, then we were given a number with "PN" preceding it. This practice is now being discontinued and no more special licences will be granted henceforward. This is, we feel, a move in the right direction.

Some months ago the Vancouver Medical Association made a temporary arrangement with the Old Age and Mothers' Allowance Pensioners' authorities by which we agreed to accept a lump sum every month to take care of this plan. Up to date this fund, which is administered by the Vancouver Medical Association itself, has proved adequate to take care of this work, and medical men express themselves as fairly well satisfied with the system. It is to be continued for a time at least on the same basis.

Lieut.-Col. D. H. Williams, now attached to the office of the D.G.M.S., has recently been in Vancouver in the course of his travelling throughout Canada. He has a very big task, that of heading up the program designed to control venereal disease both in the Army and amongst civilians.

J. H. MACDERMOT

Manitoba

Dr. W. H. G. Gibbs, medical health officer for Selkirk and district, left by plane recently to visit a number of Indian reservations in the north.

Free hospitalization and treatment for contagious disease has been recommended recently to Winnipeg's city council by the health committee of the council. The report urged free hospitalization for scarlet fever, diphtheria, infantile paralysis, meningitis and smallpox. Free hospitalization on the recommendation of the health officer would be provided for patients with measles, whooping cough, mumps and scabies. An amendment to the city charter will be necessary before action can be taken. Free treatment for city residents with tuberculosis was granted a year ago.

At the annual meeting of the honorary attending staff of the Winnipeg General Hospital on January 25, the

Superintendent, Dr. H. A. Coppinger, reported that Mr. W. A. Murphy, Chairman of the Board of Trustees, and Mr. H. E. Sellers had raised a considerable sum of money for the future building program. He mentioned improvements in conducting the affairs of the hospital suggested by the representative of the American College of Surgeons. Dr. Thorlakson, chairman of the accommodation committee outlines the reasons for the heavily increased demands for hospital beds, and referred to the plans set up for the creation of a medical centre about the medical college after the war. Dr. Kitchen, head of medical division, mentioned the inauguration of a weekly therapeutic clinic. Dr. McQueen, head of gynaecology, reported a monthly follow-up clinic for cancer patients. Dr. Waugh, head of surgery, spoke of the difficulty in obtaining clinical material for teaching. Dr. McGuinness stated that in 1943 there had been 1,399 deliveries and that in the last 3,800 confinements there had been only one maternal death. Dr. Pincock referred to the marked increase in the number of psychiatric patients which necessitated a shorter stay in hospital. Dr. Nicholson, pathologist, mentioned the increased work brought about by the institution of a blood bank to which 1,345 donors had contributed. The laboratory space, he said, was only one-third of what it should be. Dr. Aikenhead said that while ether headed the list of anaesthetic agents, 35.2% of general operations were done under spinal anaesthesia.

The officers for the ensuing year are: *Chairman*—Dr. W. E. Campbell; *Vice-chairman*—Dr. F. G. McGuinness; *Secretary*—Dr. B. D. Best; *Program*—Dr. K. Trueman.

The friends of Dr. A. G. (Fred) Henderson of Winnipeg are pleased to learn that he has escaped into Switzerland from a German prison camp. He and his wife were interned when the S.S. *Zamzam* was torpedoed by a German raider two years ago. Mrs. Henderson was repatriated about a year ago.

An increase of 38% in the sale of Christmas seals for travelling clinics over the previous year's returns is reported by Dr. E. L. Ross, Medical Superintendent of Ninette Sanatorium. Money from the sale of seals finances the travelling clinics and the rehabilitation program.

Dr. R. G. Ferguson, Director of Tuberculosis in Saskatchewan, has been invited by the Winnipeg Medical Society to address its members on his experience with BCG immunization of nurses, medical students and Indians.

ROSS MITCHELL

New Brunswick

The monthly meeting of the Saint John Medical Society was held at the General Hospital January 27. Dr. E. A. Petrie, Vice-president was chairman. The subject for discussion was "Health insurance". This meeting was specially arranged to allow all R.C.A.M.C. officers as well as naval and air force medical officers to hear and discuss problems relating to health insurance. Lt.-Col. A. A. James, D.M.O., M.D. No. 7, had circularized all service doctors and a fine attendance was the result. Camp Sussex, Camp Utopia and Navy and D.P.N.H. doctors being represented.

Major W. O. McDonald and Dr. A. Stanley Kirkland introduced the subject, giving a skeleton sketch of the proposed legislation and a short report on the recent survey of medical man power. Questions were answered when information was available and discussion was "wide open". Ideas old and new were ventilated and it was felt that much good was accomplished, so much so that it was unanimously decided that another similar meeting would be called when the Federal Government indicated their intentions concerning health insurance to Parliament.

Out of the opinions offered the following seemed of interest:

1. As doctors we must make up our minds as to what we want rather than what we do not want.

2. It was agreed that we prefer health insurance rather than state medicine.

3. Under health insurance the position of physicians will be very different from what exists at present; therefore some device should be evolved to afford protection of doctors from frivolous or serious suits or investigations instigated either by political groups, pressure groups, individuals or by the administration of the Act.

4. It was proposed that in each province a tribunal of medical men be provided for under the Act to assess the reasonableness of any complaint made against a doctor under the Act. The finding of such a tribunal would be an excellent guide to lawyers or courts in undertaking the prosecution of a doctor accused of any dereliction of duty under the Act.

5. It was felt that under any system of national medical care the provision of facilities for treatment as well as the provision of doctors should be kept well in the forefront of national thinking.

Similar meetings are hoped for at Fredericton, Moncton and Edmundston when combined groups of civilian and service doctors may study the information on health insurance at our disposal.

Dr. R. J. Collins, Superintendent of the Saint John Tuberculosis Hospital was honoured by the N.B. No. 1 Tuberculous Veterans' Section Branch of the Canadian Legion when they decided to change the name of the Section to the "Dr. R. J. Collins Memorial Branch". It was stated that Dr. Collins' great work among the veterans of the Dominion was widely known and recognized and his work in the branch is without parallel.

Dr. J. B. McKenzie, long one of the most outstanding surgeons of the northern part of New Brunswick is seriously ill at his home in Newcastle. The doctor returned to his home on Christmas Day from Montreal where he had gone for surgical treatment. His son Dr. Robert McKenzie of the Royal Canadian Navy is with his father.

The officers of the Standardization Board of the Saint John General Hospital for 1944 are: President—Dr. J. K. Sullivan; Vice-president—Dr. Geo. White; Secretary—Dr. Eli Davis.

At Saint Joseph's Hospital the officers of the Standardization Board are: President—Dr. L. McPherson; Vice-president—Dr. W. J. Baxter; Secretary—Dr. C. G. Key. Saint Joseph's Hospital elected their medical board officers for 1944 as follows: President—Dr. V. A. Snow; Vice-president—Dr. E. W. Lunney; Secretary—Dr. E. A. Petrie.

Dr. A. L. Donovan, of Saint John, is at present doing postgraduate study in Toronto.

The Saint John Junior Board of Trade has sponsored an active campaign of education on venereal disease and are using the press, radio and public meetings to reach a wide public audience. Addresses are given frequently by selected speakers, lay and medical, and advice and assistance have been provided by Royal Army Medical Corps officers, the Provincial Department of Health, city health officers and the local medical profession.

A. STANLEY KIRKLAND

Ontario

Colonel Hagerman, D.D.M.S., M.D. 2, is on sick leave and is visiting relatives in Alberta.

Four hospitals are being mobilized in Ontario for service overseas. Lieut.-Col. C. V. Mulligan is officer commanding in Montith and Colonel Hugh Cameron is O.C. in Listowel.

Captain F. L. Thompson who has been serving on induction Medical Boards in the Army reception centre in Toronto has been retired under the age limit regulations.

Dr. R. B. McClure of the Friends Ambulance is home on leave from Burma. He addressed the Canadian Club in Toronto in January.

The Toronto Academy of Medicine gave an enthusiastic reception to Dr. Clayton W. Greene, Professor of Medicine, University of Buffalo Medical School on February 1. Dr. Greene read a paper on "Confusing pictures in renal disease".

On February 8 Dr. Henry E. Sigerist, Professor of the History of Medicine in Johns Hopkins University, addressed the Academy on "Health insurance versus state medicine". It is hoped that his paper will be available for publication as it was a real contribution to the understanding of some of the problems now facing the medical profession in Canada.

A gift of \$100,000, intended to "further the knowledge of disease caused by the conditions and hazards incidental to industry, so that such conditions may be improved and such hazards may be removed," has been made to the University of Western Ontario by Mrs. William M. Gartshore, widow of a former president of the McClary Manufacturing Company.

Prince Edward Island

Dr. E. A. Giddings, president of the Prince Edward Island Medical Society, was recently absent from his office in Charlottetown for a period of two weeks, during his absence Dr. Giddings attended Quebec's International Curling Bonspiel. The rink skipped by Dr. Giddings lost to Tancrede Boucher of Etcheming, Quebec, in the Governor-General's trophy play.

Dr. J. A. McMillan, Charlottetown, President of the Maritime Hospital Association and Member of the Canadian Hospital Council, was recently in Woodstock, N.B., conducting an investigation into the situation at the Fisher Memorial Hospital which culminated a few weeks ago in the superintendent, Miss Elsie Tulloch, barring Dr. G. N. Belyea, Woodstock surgeon, use of the institution.

Dr. McMillan will make a report to the board of trustees at an early date. He was suggested as an arbitrator by Dr. H. Agnew of Toronto, who was unable to come east to make the investigation, after having been suggested by Dr. M. T. MacEachern, director of the American College of Surgeons, who was originally asked to conduct the investigation.

Promotion to the rank of lieutenant-colonel of Major William Soper, 42, assistant to District Medical Officer, M.D. No. 6 headquarters and officer commanding No. 6 Co., R.C.A.M.C., was announced recently at district headquarters.

Halifax-born, Col. Soper went on active service with the Royal Canadian Army Medical Corps shortly after the outbreak of war and has held many important posts at Nova Scotia, Newfoundland, and Ontario military hospitals. He attended St. Mary's College, Halifax, and St. Francis-Xavier University, graduating from Dalhousie Medical School in 1928 with M.D., and C.M., degrees. He was employed by the Newfoundland Government at various Newfoundland centres from 1928 to 1931. In 1931 he joined the surgical staff of the Charlottetown Hospital where he remained until enlisting in the Active Army. Serving with the non-permanent active militia from 1934 to 1939, Col. Soper's first appointment after going on active service was the command of the Port Hawkesbury military hospital. He relinquished this post in January, 1940, to take command of Botwood military hospital. From May, 1942,

to November, 1942, he was president of the standing medical board for military district No. 6. His next appointment took him to A 11 C.I.T.C. Camp Borden, where he acted as regimental medical officer. Command of No. 6 Co., R.C.A.M.C., and appointment as assistant to the district medical officer came in September, 1943.

W. J. P. McMillan, M.D., C.M., F.R.C.S., LL.D., O.B.E., of Charlottetown, and Leader of the Opposition in the Provincial Government, was re-elected Provincial President of the Red Cross Society at the Annual Meeting held on February 11, 1944.

A. J. Murchison, M.D., C.M., Charlottetown, was re-appointed as a member of the Executive.

Dr. McMillan has held the office of Provincial President since January, 1938. In his report the President stated it was a "banner year of unprecedented success" and gave unstinted praise to all for supporting the last Red Cross Campaign so nobly when over \$99,000.00 was subscribed against the \$50,000.00 objective, and hoped to see over \$100,000.00 subscribed in the approaching Red Cross Drive of 1944. H. D. Johnson, M.D., C.M., Charlottetown, was reappointed as an Honorary Vice-president.

Capt. Leo McKenna, M.D., C.M., London, Ontario, now serving overseas, has recently been promoted to the rank of Major. Dr. McKenna was formerly of Charlottetown, and was a veteran of the last war.

Quebec

Under the heading "That Delegation" *L'Action Medicale* publishes in its January number an account of an interview with the Provincial Cabinet of Quebec on the subject of the Health Insurance Commission appointed by the Province last year. This commission consists of a lawyer as chairman, one doctor, chosen with no regard to any special qualifications for such work, and a broker. It was felt that such a selection was to say the least, anomalous, and a delegation went to Quebec to make its protest. The following medical bodies were represented: the College of Physicians and Surgeons of the Province of Quebec, the Federation of the Medical Societies of Quebec, the Quebec Division of the Canadian Medical Association, and the Association of the French-speaking physicians of North America.

Dr. J. E. Desrochers, President of the Provincial College, introduced the delegation and then went on to voice the general feeling of his colleagues with regard to the composition of the Commission. Dr. Desrochers assumed that the Government was genuinely concerned in solving problems of public security and the associated questions of the burden of sickness. In this latter respect however he felt that one principle of prime importance must be kept in mind, that namely of the relation between doctor and patient. It must never be forgotten too that the work of the medical profession could not be reduced to a merely business transaction. In his view and that of his colleagues therefore, the chairman of the commission should certainly be a medical man. This, it was pointed out by another speaker, was as much in the interests of the public as of the profession, and it was emphasized that the public interest was being given first place in the minds of the profession.

From the reply made by the Cabinet it became clear that this so-called Health Insurance Commission was really set up to deal with matters of Social Security rather than with medical services. For this reason it was stated that it was felt a lawyer should quite properly be chairman rather than a doctor. At the same time, the statement was made that all members of this commission would be on the same salary basis of \$10,000 per annum. Apparently, the

ministers who made this explanation, felt that it excused the anomaly of the appointments. Whether it satisfied the delegates, or anyone else, is another matter.

Dr. J. A. Vidal, professor in the Faculty of Medicine at the University of Montreal and a member of the staff of the Sacred Heart Hospital, Cartierville, has been elected president of the Provincial Committee for the Prevention of Tuberculosis. He succeeds Lieut.-Col. J. A. Couillard.

Dr. Adelard Groulx, head of the City Health Department and president of the Canadian Public Health Association, has been named vice-president of the committee. Dr. Georges Gregoire was re-elected secretary and Jean Marie Turgeon was renamed as head of the committee's publicity work.

Speakers at a meeting at Cercle Universitaire stressed the need for 1,500 more beds to care for tuberculous patients in Montreal.

Au cours de sa réunion générale annuelle, le 21 décembre dernier, en l'hôpital de la Miséricorde, la Société Médicale a élu son Bureau de Direction pour l'année 1944.

Le nouvel exécutif se compose du docteur J.-U. Gariépy, président; Paul Letondal, vice-président et directeur des programmes scientifiques; Roger Dufresne, secrétaire général; Edouard Desjardins, trésorier, et Raymond Labrecque, secrétaire des séances.

Le docteur Adélard Groulx, président sortant de charge, félicita le docteur Letondal du magnifique travail qu'il a accompli à La Société Médicale depuis cinq ans, à titre de Secrétaire général, et présenta ses meilleurs vœux de succès aux membres du nouvel Exécutif.

La Revue Canadienne de Biologie completes its first two years of publication with the December, 1943, issue. We note the following contents of this number:

Eduardo Cruz Coke: "La production de chaleur et les deux facteurs qui la composent: vitesse et rendement."

Henri Laugier et Charles-Philippe Leblond: "Influence du jeune et de la réalimentation sur la résistance à l'anoxie."

G. Masson and E. Beland: "Influence du potassium sur l'action renotropique des substances stéroïdes."

M. A. Sergeyeva: "Numerical changes of A- and B-cells of the islands of Langerhans produced by sympathetic and parasympathetic stimulation in the cat pancreas."

Hans Selye: "On the production of malignant hypertension by chronic exposure to various damaging agents."

Fernand Sequin and Louis-Paul Dugal: "Absorption rectale du sulfathiazole."

Louis-Paul Dugal, Henri Laugier and Lambert Desaulniers: "Recherches sur la cicatrisation des plaies. II. Effets comparés sur la rapidité de cicatrisation, du sulfathiazole seul et du sulfathiazole additionné d'acide oxalique."

Marcel Cailloux: "Un nouveau micromanipulateur hydraulique."

Comptes rendus des séances de la Société de Biologie de Montreal.

There is also an index for the year's material.

JEAN SAUCIER

Saskatchewan

About twenty members of the Central Health Insurance Committee met in Regina recently to consider the progress that has been made throughout the Province, and particularly the work of the Study Group, on the matter of Health Insurance in Saskatchewan. The agenda included reports from groups representing medical officers of the Armed Forces, municipal doctors, salaried men and specialists.

The monthly *Health Insurance Bulletin* is also now being mailed to about 90% of the Saskatchewan men on active service. A postcard or letter to Dr. A. W. Argue, 404 Birks Bldg., Saskatoon, will bring these Bulletins to any Saskatchewan man not receiving them.

A committee has been set up, under the chairmanship of Dr. Argue, to prepare a brief, outlining the aims and objects of the medical profession for the future, and it will be presented early in March to the newly formed Saskatchewan Reconstruction Council.

Captain Frank S. Macdonald, of Saskatoon, a Reinforcement Officer with the R.C.A.M.C., left Canada recently for overseas duty.

Three former Saskatchewan men have taken practices in other Provinces, Dr. S. W. Arthur, formerly of Redvers, is located at Portage la Prairie, Man.; Dr. J. A. O'Brien has left Spalding and is reported practising at Laverne, Alta., and Dr. E. N. Macdonald from Saskatoon has located in Edmonton.

Saskatchewan men reporting for active service since the new year are Dr. R. E. Strohan, of Saskatoon, with the R.C.A.M.C., and Dr. H. L. Yoerger, of Turtleford, with the medical corps of the R.C.N.

The month of January saw four new Saskatchewan registrations, Dr. Harley D. Jenner, Toronto '33, and Dr. Wm. A. Allen, Toronto '42, both with the T.B. Sanatorium at Prince Albert; Dr. Bernard LaBelle, who left an Ontario practice to locate at Hoey, Sask.; and Dr. Gaston Robinson, Laval '37, who is associated with Dr. G. S. Goodwin, of Moose Jaw.

The annual meeting of the Saskatoon and District Medical Society was held at the Saint Paul's Hospital on January 25, 1944. Dr. A. A. Scharf was elected president and Dr. L. Schulman, secretary, for the new year.

Through the kindness of Captain G. A. Hancock, a technicolour and sound film on syphilis—prepared by the United States Health Services—was presented.

H. D. HART

General

Promotion of the two senior officers of the Canadian Army Medical Services to the rank of acting Major-General was announced in February by Defence Headquarters. The promotions:

Brig. George Brock Chisholm, C.B.E., M.C., 47, of Oakville, Ont., Director General of Medical Services at Defence Headquarters, to be acting Major-General, effective February 1.

Brig. R. M. Luton, C.B.E., M.C., 52, of Halifax, Director of Medical Services, Canadian Army Overseas, to be acting Major-General, effective February 7.

Gen. Chisholm has been Director General of Medical Services for the Army since September 7, 1942. Since then he has instituted a number of changes in procedure in Army medical service practice, including the Pulhems system of reporting on an individual's fitness for service and for classification.

The Problem of Rheumatic Fever.—At a recent conference in New York City, under the auspices of the American Heart Association, and the chairmanship of Dr. H. M. Marvin, various aspects of the problem of rheumatic fever, particularly as it affects the Armed Forces, were discussed by leaders in the field of research on this problem. As a result of the deliberations of this conference, the establishment of a "Council on Rheumatic Fever" was decided on, with the object of study, prevention and treatment of this disease. The Council is to be set up under the leadership of the



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American Heart Association, and is to include representatives of all interested organizations.

The resolution in accordance with which this decision was reached, was as follows:

"Because of the magnitude and importance of the rheumatic fever problem, this conference is strongly in favour of the extension of public programs, supported by Federal, State, and local funds, for the study, prevention, and treatment of this disease. Moreover, we believe it essential that additional funds be secured from private sources for the purpose of special studies to increase basic knowledge of the disease, for professional education, and for increasing public awareness of the problem.

"In order to accomplish the purposes mentioned above, this conference recommends that a Council on rheumatic fever be formed under the leadership of the American Heart Association, and that this Council shall include representatives of interested organizations."

The outline of the study now being carried on in the Forces of the United States, was outlined by Colonel Holbrook, and some observations of army personnel were related by General Hugh Morgan. Dr. T. Duckett Jones, Boston, and Dr. Martha Eliot, of the Children's Bureau, Washington, outlined the scope of the problem as regards the civilian population, and told something of the present efforts that are being carried out in State-aided programs, with the assistance of the Children's Bureau.

As this problem affects equally the Armed Forces of the Dominion, it is to be hoped that when further Conferences are called, representatives from the Canadian Armed Services may be invited to attend, as the occurrence of the disease in groups in the Armed Forces would appear to be a medical method of getting statistical evidence regarding the background, frequency and end results of this disease, in a group of young adults under control conditions.

Further action by the Council will be awaited with intense interest.

Urology Award.—The American Urological Association offers an annual award "not to exceed \$500" for an essay (or essays) on the result of some specific clinical or laboratory research in Urology. The amount of the prize is based on the merits of the work presented, and if the Committee on Scientific Research deem none of the offerings worthy, no award will be made. Competitors shall be limited to residents in urology in recognized hospitals and to urologists who have been in such specific practice for not more than five years. All interested should write the Secretary, for full particulars.

The selected essay (or essays) will appear on the program of the forthcoming meeting of the American Urological Association, June 19 to 22, 1944, Hotel Jefferson, St. Louis, Missouri.

Essays must be in the hands of the Secretary, Dr. Thomas D. Moore, 899 Madison Avenue, Memphis, Tennessee, on or before March 15, 1944.

Royal College of Physicians of Edinburgh.—At the annual meeting held on December 2, 1943, Dr. A. Fergus Hewat, F.R.F.P.S.G., F.R.S.E., was elected President, and Drs. Charles McNeil, L. H. F. Thatcher, A. Ninian Bruce, D. M. Lyon, W. A. Alexander and D. K. Henderson were elected to form the Council for the ensuing year. Dr. D. M. Lyon was nominated Vice-president.

Medicine is merely one link in a chain of social welfare institutions that every civilized country must develop. If we have a maladjustment today, it is to a large extent due to the fact that we have neglected the sociology of medicine. For a long time we concentrated our efforts on scientific research and assumed that the application of its results would take care of itself. It did not, and the technology of medicine has outrun its sociology.—*Civilization and Disease*, H. E. Sigerist, Cornell University Press, 1943.

Book Reviews

Field Care and Transportation of the Injured. 117 pp., illust. U.S. Office of Civilian Defense, Washington, D.C., 1943.

This booklet is issued by the Office of Civilian Defense, Washington. It is intended for the advanced training of rescue workers, medical auxiliaries and others who may have to care for the injured before they reach a physician or hospital. In other words, it deals with first-aid work, although it includes other material regarding air-raid precautions.

The book is compact and includes the essentials of bandaging and first aid treatment. There are also all the latest methods of blanketing casualties and their transportation with and without stretchers. It will be of considerable use to those interested in first-aid work.

Fractures and Dislocations for Practitioners. E. O. Geckeler. 3rd ed., 361 pp., illust. \$5.40. Williams & Wilkins, Baltimore; University of Toronto Press, Toronto, 1943.

The necessity of a third edition of this work since its first appearance in 1937 indicates the excellence of this short textbook. In approximately 350 pages the writer has covered his subject in sufficient detail for the general medical man dealing with fractures. The material is excellent, too, from the medical students' point of view. There are naturally in a book of this size many limitations in detail which would be required in a text for a fracture specialist.

The general principles underlying the treatment of fractures and dislocations together with the accepted principles on organizations, such as continuity of treatment from beginning to end by the one physician, are well emphasized. The writer has approached his subject from the conservative point of view and the discussion concerning the selection of cases for open operation for reduction and plating has therefore been largely curtailed. There is no mention of methods of external fixation. It is most interesting to note the emphasis on follow-up and physiotherapy.

The arrangement of the material and the illustrations are excellent.

This book can be highly recommended for use by surgeons, practitioners, interns and students. It covers the subject, considering the space allotted, in admirable manner.

Borderlands of Psychiatry. S. Cobb, 166 pp., illust. \$2.50. Harvard University Press, Cambridge Massachusetts, 1943.

This book, as stated in the introduction, "is a series of essays on a group of subjects that have long been of special interest to the author". In the first chapter and throughout the "body and mind" enigma is considered with an able defense of the "psychogenic" point of view. In spite of this the writer, as only he could, brings neuroanatomy and neurophysiology together with psychology in the discussion of such problems as speech and its defects, frontal lobe function, emotions, consciousness, and fits. A chapter is devoted to each of these problems as well as the psychoneurosis and psychosomatics.

The author presents several case-histories by an illuminating method that brings out clearly the relationships between medical findings, disorders and social data. The other black and white diagrams and illustrations are excellent. These are somewhat in contrast to some of the actual text where the author does not always make himself clear. For instance, on page 107, in the discussion of the prevention of epilepsy, the text is contradictory, to say the least. One suspects that in this case the author is trying to deal with the broad question of race improvement or deterioration and in the same few sentences advise the physician in a specific case.

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Michel Sarrazin

PHYSICIAN AND SURGEON
(1659-1734)

SARRAZIN was the most famous physician and surgeon of his day in Canada. In addition, he achieved distinction as a naturalist. He was born in Nuits-sous-Beaune, in Burgundy, France, in 1659. He obtained his medical degree at the University of Rheims. The year 1686 found him serving as Surgeon Major of the French troops at Quebec where he remained and entered into the life of the colony.

He was chosen as physician of l'Hôpital Général by the Sisters in 1693. A year later he returned to France for further study. Returning to Canada aboard the "Gironde", he fought a severe outbreak of typhus and saved many lives including that of Mgr. de St. Vallier, Bishop of Quebec and founder of the Hôtel-Dieu, Quebec.

Papers written by Sarrazin on Canadian wild life earned him membership in the Royal Academy of Sciences (France). These works included anatomical studies of the lynx, muskrat, deer, moose, porcupine and the beaver. He catalogued 200 Canadian plants and also wrote a treatise on the production of maple syrup.

Sarrazin operated for what is believed to have

been cancer on the persons of Sister Marie Barbier and Sister Elizabeth Cheron. He is reported to have performed several similar operations and "others more difficult". He is credited with the introduction of the pitcher plant (*Sarracenia Canadensis*) for the treatment of smallpox.

This great pioneer physician and surgeon received little or nothing from his patients. As Doctor of the King, he was granted 300 livres a year and even when this was increased to 600 livres, Sarrazin was so hard put that he expressed a desire to leave the colony. To prevent his departure and augment his income he was made a member of the Superior Court. Later, his emolument was increased to 2,000 livres per annum.

Still active at 75, Sarrazin fell ill and died of hemorrhagic smallpox at the Hôtel-Dieu, Quebec, on September 8th, 1734, after two days' illness.

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The informed reader will also take issue with a number of the author's views. These are not always consistent. For example, in the introduction "the chief problem in psychiatry will probably always be the committed hospital patient"; then in discussing psychoneurosis, "the province of psychiatry is that group of human disorders that have predominantly psychological symptomatology". With such a narrow horizon there are many "borderlands" not appreciated such as industrial psychiatry, geriatrics, child psychiatry, nutritional, endocrine, infectious and post-traumatic types to mention only a few.

The bibliography has been carefully selected and is an excellent guide for one reading on the subjects considered.

Addendum to the Chemistry of the Amino Acids and Proteins. Edited by C. L. A. Schmidt. 255 pp., illust. \$6.25. Thomas, Springfield, Ill.; Ryerson Press, Toronto, 1943.

In describing the large volume to which the present work is a supplement, the reviewer (this *Journal*, 1939, 41: 220) said that it could be unreservedly recommended to readers willing to make a real effort to master the complex modern concepts of protein physical chemistry, but not to the beginner. The supplement now considered, bound in harmony with and paged in continuation of the original, consists of addenda to sixteen of the eighteen original chapters. These addenda, written in almost all cases by the original contributors, vary in length from four to sixty pages, and cover important advances made and data secured in the five years following completion of the original manuscript. The advances are in many fields, but special mention may be made of the descriptions of the Tiselius method for studying electrophoretic mobilities, of the solubility method for determining the purity of protein preparations, of the x-ray analysis of amino-acid and protein crystals, and (in a field only lightly touched in these volumes) of the study of protein metabolism with the aid of isotopes of hydrogen and nitrogen. Everyone who has learned to use the original volume profitably will be glad to have it brought up to date by means of this addendum, though the price may be rather deterring. The excellent quality of the paper and printing is well maintained.

Handbook of Tropical Medicine. A. C. Read and J. C. Geiger. 188 pp. \$1.50. Stanford University Press, California, 1943.

During the war of 1914-1918 medical officers of the British Army who were sent to the Near and Middle East were provided with a small handbook dealing with "tropical" diseases. Drs. Reed and Geiger have published one of a similar kind and, as a result of expanded knowledge, of greater scope.

This handbook provides a concise, comprehensive survey of the field of tropical medicine. The various illnesses peculiar to, or more commonly encountered in, the tropical zones are discussed briefly, simply, and effectively. The headings under which the diseases are described include causative agents, treatment, prevention and control.

An occasional minor error has been noted, as on page 4, where it is stated that cysts of *Entamoeba histolytica* invade the wall of the colon, whereas on page 2 the pathogenesis is correctly described. In the treatment of amoebiasis the authors prefer carbarsone to emetine. No mention is made of emetine bismuth iodide. On page 17 it is stated that in bacillary dysentery the red cells are often in rouleaux: in the reviewer's experience this was more commonly a feature of the faeces in amoebic dysentery.

Considering the size of this book the amount of useful information it contains is noteworthy. It can be recommended to all medical officers who may have to go to the tropics on short notice.

Clinical Parasitology. C. F. Craig and E. C. Faust. 3rd ed., 767 pp., illust. \$10.35. Lea & Febiger, Philadelphia; Macmillan, Toronto, 1943.

The third edition of this work does not differ materially from the earlier ones. Several new plates have been added, and considerable additions have been made to the portions dealing with diseases transmitted by arthropods; there are several new tables, and the text has been given a general revision. There are now 767 pages, 13 tables, 284 text figures, and 4 coloured plates. The volume is an extremely valuable one, but it suffers from the fault, shared by most other "clinical" parasitology texts, in including far too much unimportant detail; space is wasted on parasites which have at most, a purely academic interest, while insufficient attention is given (in some cases none at all) to others of much more practical importance. Moreover, some important modern references—mostly from outside of the United States—have not been consulted. Apart from these comparatively minor faults, the book is a good one.

Modern Treatment in General Practice Year Book 1943. Edited by C. P. G. Wakeley. 260 pp., illust. \$3.75. Medical Press, London; Macmillan, Toronto, 1943.

This is the ninth volume in the series. It continues to hold its place as a highly practical and reliable guide in modern diagnostic and therapeutic methods.

An Introduction to Medical Mycology. G. M. Lewis and M. E. Hopper. 342 pp., illust. \$6.50. Year Book Publishers, Chicago, Ill., 1943.

The necessity of a second edition of this book is fully justified. The work is an excellent introduction to medical mycology, which has done much to bring medical mycology to the notice of the general practitioner. The illustrations to exemplify the conditions described are all that can be desired, and assist in the diagnosis of dermatophytoses, dermatophytids and allied conditions. The number of plates has been increased to 77, with over 350 individual photographs. There are also two fine colour plates showing fungus colonies. These photographs, with the simple and careful descriptions, make one of the best features of the book. The authors have had the advantage of a large amount of clinical material from which to make a selection. The instructions as to treatment are very thorough and complete, simplified and reduced to practical methods. Special mention is made of the value of ultra-violet light in the diagnosis and treatment of ringworm of the scalp in children.

Laboratory methods described in part II, are described with minute detail. Simple practical methods of preparation of specimens from hair, skin, and nails, and various tissues are given. Cultural methods, with excellent illustrations of the various growths, are shown. A complete bibliography is appended to each chapter. The authors are to be congratulated on a very painstaking work, well illustrated, and produced on excellent paper.

Evolution y Funcion Biologica de las Proteinas. J. Mendez. 139 pp. Guillermo Kraft Ltda., Buenos Aires, 1943.

In an authoritative manner the writer has brought together in a monograph a series of lectures dealing with the intimate structure of proteins. In great detail the molecular and atomic structure is discussed in order to make clearer the evolution of the proteins. He very ably discusses the configuration of macropoteins (fibrinogen—fibrin—and collagen); mesoproteins, micropoteins, and (amino-acids). Edema, transudates, dehydration, acidosis, alkalosis, and treatment, are briefly given in his fourth lecture. Physiological and pathological (inflammation) peptonization is very interestingly reviewed.

This monograph, written in Spanish, is well presented, and students in physiology should find it a valuable contribution.

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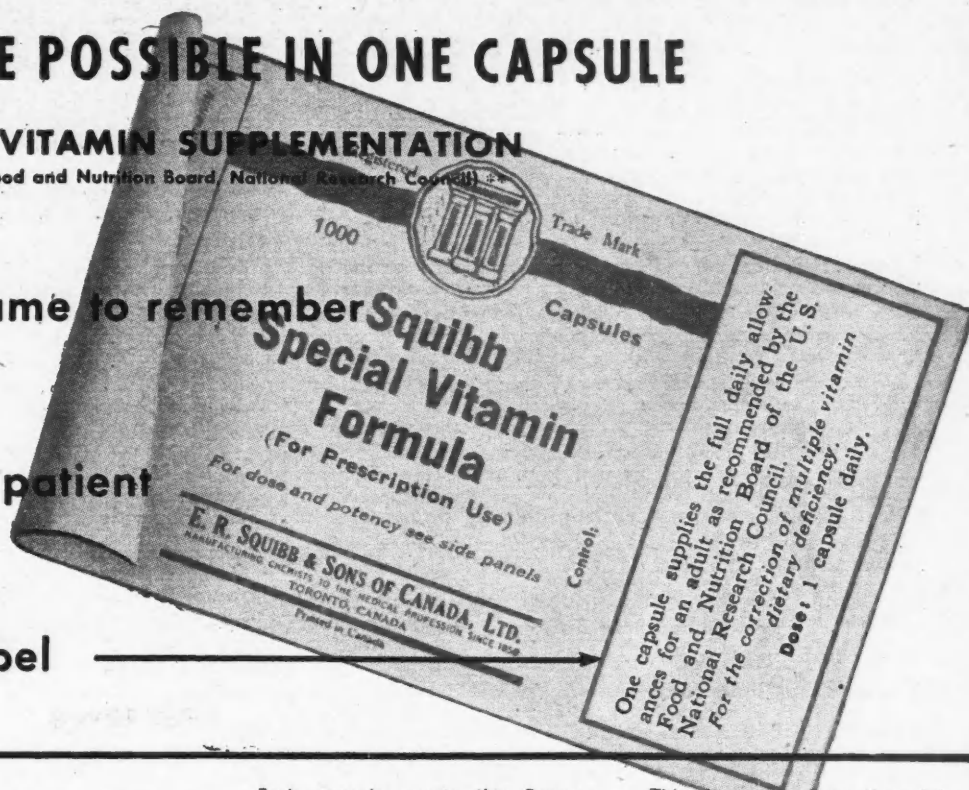
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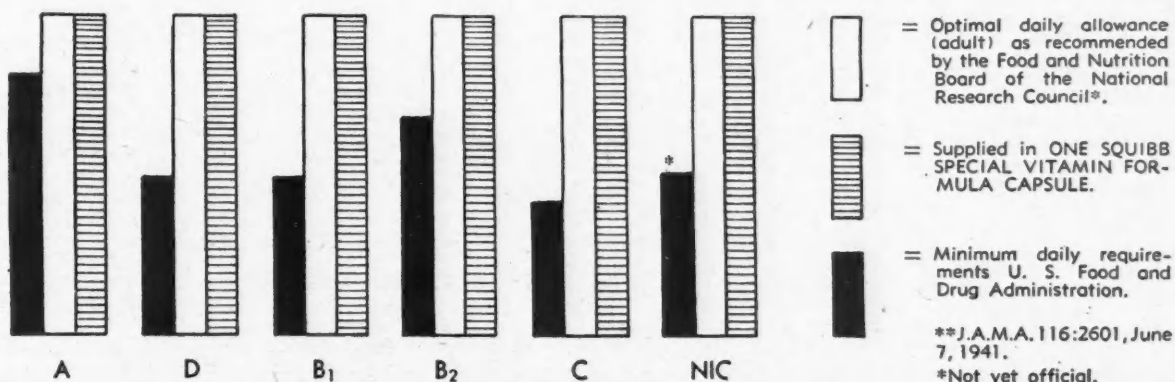
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Rehabilitation of the War Injured. Edited by W. B. Doherty and D. D. Runes. 684 pp., illust. \$10.00. Philosophical Library, New York, 1943.

This valuable work comprises a symposium on the subject of rehabilitation of the war injured. The contents are divided into seven main sections dealing with the following aspects: Neurology and psychiatry; reconstructive and plastic surgery; orthopaedics; physiotherapy; occupational therapy and vocational guidance; legal aspects of rehabilitation; miscellaneous.

Each section is composed of several articles by well known writers dealing with the many problems involved. These articles are taken from most of the well known medical journals of this continent and the British Isles. Each person picking up this book will probably read topics devoted to discussion bearing on his specialty and in this respect the work will be of especial interest to a wide circle of medical men.

The illustrations, being secondary reproductions, are poor, but apart from this point the book is well presented. It can be recommended as a most timely production and one that should find its way to all concerned in the rehabilitation, not only of the war injured, but also those injured in this, the industrial, mechanical and traumatic stage of civilization.

Lip Reading Study and Practice for Adults. M. Faircloth. 26 pp. \$1.50. Ryerson Press, Toronto, 1943.

The large army of deaf and hard of hearing are in constant need of guidance in improving their lot. This book is a very practical attempt to teach lip reading. The author has had great experience in this work, and has managed to compress much instruction into a comparatively small space. To the many interested in this work this book should be of great assistance.

Atlas of Anatomy, Vol. 1. J. C. B. Grant. 214 pp., illust. \$5.75. Williams & Wilkins, Baltimore; University of Toronto Press, Toronto, 1943.

This volume contains illustrations of upper limb (67), abdomen (42), perineum and pelvis (32), and lower (86). (The second volume is to comprise principally thorax, head and neck, vertebral column and back.) The illustrations depict most of the major structures in the regions specified, in a sequence similar to the one in which a student displays them by dissection. The pictures are well drawn, accurate, lucid, and well labelled, the British (Birmingham) revision of the Basle terminology being used throughout, with Basle terms in addition where they differ greatly from the Birmingham terms. (Many students will find the English translations preferable to the Latin that is still retained in the larger atlases.) Explanatory notes add to the value of the pictures. Most of the specimens depicted are in Professor Grant's excellent collection in the Toronto University anatomical museum, and students will find the atlas very useful as a supplement to larger works, especially if they use the author's *Method of Anatomy*.

Colour is used chiefly for vessels and nerves; muscles, bones and ligaments are shaded. Some of the pictures could profitably have been larger. These slight drawbacks, however, are doubtless due to an effort to keep the price down, and perhaps to publishers' caution with a first edition.

A review in this *Journal* should in the main consider a book from the point of view of a graduate, especially of a graduate in clinical practice. A general practitioner, however convinced he may be of the value of anatomy, has little time or inclination for the extensive study of textbooks, but he could do much to keep his mental pictures of regional anatomy clear if he would repeatedly study illustrations drawn from actual dissections, and his accuracy in differential diagnosis would improve if he would develop the habit of referring to such illustrations when faced with a diagnostic problem.

As a supplement to one of the larger and more abundantly illustrated textbooks or atlases, the present

atlas will be useful to practitioners. If it is to be more useful to them, the question for future editions may be: would it be better to enlarge it greatly (and probably reach the price-class of the larger atlases), or to retain it as a supplementary work, but confine its illustrations more to unusual dissections—ingenious types of display and emphasis for which its author is justly renowned?

Biomicroscopy of the Eye. M. L. Berliner. Vol. 1, 709 pp., illust. \$17.50. P. B. Hoeber, New York, 1943.

The first volume of Dr. Berliner's treatise of the Biomicroscopy of the Eye which has been eagerly awaited by the ophthalmic profession for some time has arrived. This first volume which deals with the technique of biomicroscopy in its early chapters and, finally, with ocular disease of the anterior segment has been well worth waiting for. As the author points out, since the early days of Vogt, Koepper, Koby, and several others, when biomicroscopy was a specialty within a specialty, this valuable form of examination has become an integral part of the armamentarium of all oculists. It is an opportune time therefore for such a volume as this which places the slit lamp in its proper diagnostic and therapeutic setting with relationship to the rest of ophthalmology.

The author deals with his subject in the above volume completely and authoritatively. His volume is profusely illustrated with two-tone black and white, and coloured illustrations. The reader cannot help but be struck by these beautiful illustrations which add so much to the presentation of such a pictorial procedure. The second volume dealing with the iris, vitreous, and lens, will be awaited with impatience, if it is anywhere nearly as good as the first. This treatise can be thoroughly recommended to the student and expert alike.

BOOKS RECEIVED

On the Therapeutic Action of the Antireticular Cytotoxic Serum "ACS". Edited by A. A. Bogomolets. 168 pp. Academy of Sciences of the Ukrainian S.S.R., Ufa, 1942.

Holt's Care and Feeding of Children. L. E. Holt. 321 pp., illust. \$2.50. Appleton-Century, New York, Ryerson Press, Toronto, 1943.

Infant Feeding in General Practice. J. V. Braithwaite, 165 pp. 2nd ed., John Wright & Sons, Bristol, 1943.

A Technical Manual for the Rescue Service. 142 pp., illust. 20c. U.S. Office of Civilian Defense, Washington, D.C., 1943.

Tuberculosis in the United States, Graphic Presentation. Vol. I. unpagged. Illust. Prepared U.S. Public Health Service. National Tuberculosis Association, 1790 Broadway, New York, 1943.

Asilo-Colonia Pirapitingui. Relatorio de Seccao Hospitalar Ano 1942. 43 pp. Empresa Grafica da Revista dos Tribunais, Sao Paulo, 1943.

The British Encyclopædia of Medical Practice. Medical Progress 1943. 410 pp. Cumulative Supplement 1943. 342 pp. Edited by H. Rolleston. \$10.00. Butterworth & Co., Toronto, 1943.

Clinics. Edited by G. M. Piersol. Vol. 2 No. 4. 266 pp., illust. \$3.00. J. B. Lippincott, Montreal, 1943.

The Care of Tuberculosis in the Home. J. Maxwell. 105 pp., illust. 7s. 6d. Hodder & Stoughton, Warwick Square, London, England, 1943.

Medical Advice from a Backblock Hospital. G. M. Smith. 96 pp. 3s. Progressive Publishing Society, P.O. Box 956, Wellington, N. Z., 1943.